United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with North Dakota Agricultural Experiment Station, North Dakota Cooperative Extension Service, USDA-Forest Service, USDI-National Park Service, and USDI-Bureau of Indian Affairs

Soil Survey of McKenzie County, North Dakota



How To Use This Soil Survey

General Soil Map

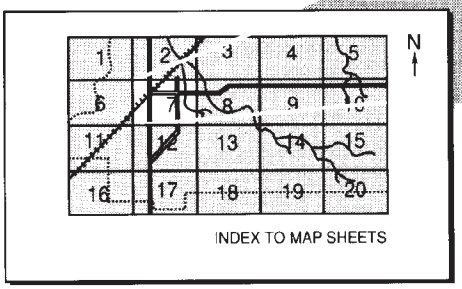
The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

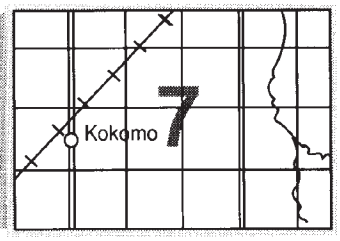
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas. (Seelig, 1993) (Broderson, 1991)

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

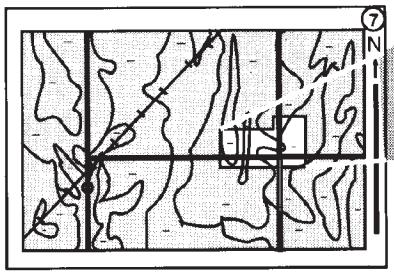


INDEX TO MAP SHEETS

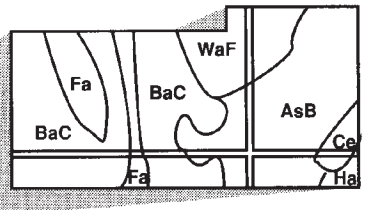


MAP SHEET

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies, including the Agricultural Experiment Station, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service, USDA - Forest Service, and USDI - National Park Service, USDI - Bureau of Indian Affairs, the North Dakota Agricultural Experiment Station, North Dakota Cooperative Extension Service, and the North Dakota State Department of Transportation. It is part of the technical assistance furnished to the McKenzie County Soil Conservation District.

Major fieldwork for this soil survey was completed in 1999. Soil names and descriptions were approved in 2003. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1988 to 1999. The most current official data are available through the NRCS Soil Data Mart Website at http://soildatamart.nrcs.usda.gov.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. Maps may not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: Little Missouri River Valley. Hanly, Glendive, and Havre soils are on the floodplains. Patent soils, the miscellaneous areas of Badland, outcrop and the steeply sloping wooded Arikara soils are adjacent to the floodplains. Cabbart and Boxwell soils are on the uplands in the background.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

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Foreword

This soil survey contains information that can be used in land-planning programs in McKenzie County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.



J.R. Flores
State Conservationist
Natural Resources Conservation Service

Where To Get Updated Information

The soil properties and interpretations included in this survey were current as of July 2006. The most current information is available through the Natural Resources Conservation Service Soil Data Mart Website as http://soildatamart.nrcs.usda.gov/ and/or the Natural Resources Conservation Service Web Soil Survey at http://websoilsurvey.nrcs.usda.gov/app.

Additional information is available from the Natural Resources Conservation Service Field Office Technical Guide at Watford City, North Dakota, or online at www.nrcs.usda.gov/technical/efotg. The data in the Field Office Technical Guide are updated periodically.

Additional information about soils and about NRCS is available through the North Dakota NRCS Web page at www.nd.nrcs.usda.gov.

For further information please contact:

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Watford City Field Office
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Watford City, North Dakota 58854-0583
Telephone: (701) 842-3628 or (701) 842-6047
Fax: (701) 842-6324

Soil Survey of McKenzie County, North Dakota

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Fieldwork by Patrick Abel, Frederick P. Aziz, Thomas Champa, Rodney Dahl, Alan Gulsvig, Dave Johnson, Gary Medlyn, Mark Morrison, Todd Solem, Dale Sprankle, Michael Sucik, Michael G. Ulmer, Darrell VanderBusch, and Hal Weiser, United States Department of Agriculture, Natural Resources Conservation Service; and Wilhelm's Soil Consulting, Inc. and Stoneman-Landers, Inc., professional soil classifiers.

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with the
United States Department of Agriculture – Forest Service, Department of Interior – Bureau of Indian Affairs and National Park Service, North Dakota Agricultural Experiment Station, North Dakota Cooperative Extension Service, North Dakota State Soil Conservation Committee, North Dakota State Department of Transportation, and the McKenzie County Soil Conservation District. Financial assistance was provided by United States Department of Agriculture – Forest Service, United States Department of Interior – Bureau of Indian Affairs, and United States Department of Interior – National Park Service.

General Nature of the County

McKenzie County is in the northwestern part of North Dakota (fig. 1). It has a total area of 1,830,800 acres of which 1,769,600 acres are land and 61,200 acres are water in bodies of more than 40 acres in size. The county is bounded on the west by Montana, on the north by the Missouri River and Lake Sakakawea, on the east by Lake Sakakawea and Dunn County, and on the south by Billings and Golden Valley counties. The county seat is Watford City.

Prior to 1900, most of the land in the county was used as open cattle range. Between 1904 and 1910, rapid settlement occurred with homesteaders arriving from eastern North Dakota, Minnesota, Iowa, and Wisconsin. Gently rolling areas around Alexander, Arnegard, and Grassy Butte were the first to be settled. Additional information concerning the history and development of McKenzie County and surrounding areas can be accessed at the Online Dakota Network at www.odinlibrary.org.

The majority of McKenzie County is in the Rolling Soft Shale Plain (Major Land Resource Area 54) of the Northern Great Plains Spring Wheat Region. The breaks along the Little Missouri River are in the Northern Rolling High Plains, Northeastern Part (Major Land Resource Area 58C) of the Western Great Plains Range and Irrigated Region (USDA-SCS, 1981). Most of the county is in the Glaciated Missouri Plateau Section of the Great Plains Province with the southwestern part in the Unglaciated Missouri Plateau Section.

The highest elevation in the county of about 2,820 feet is located in the Blue Buttes area. The lowest elevations are along the Missouri River where the pool

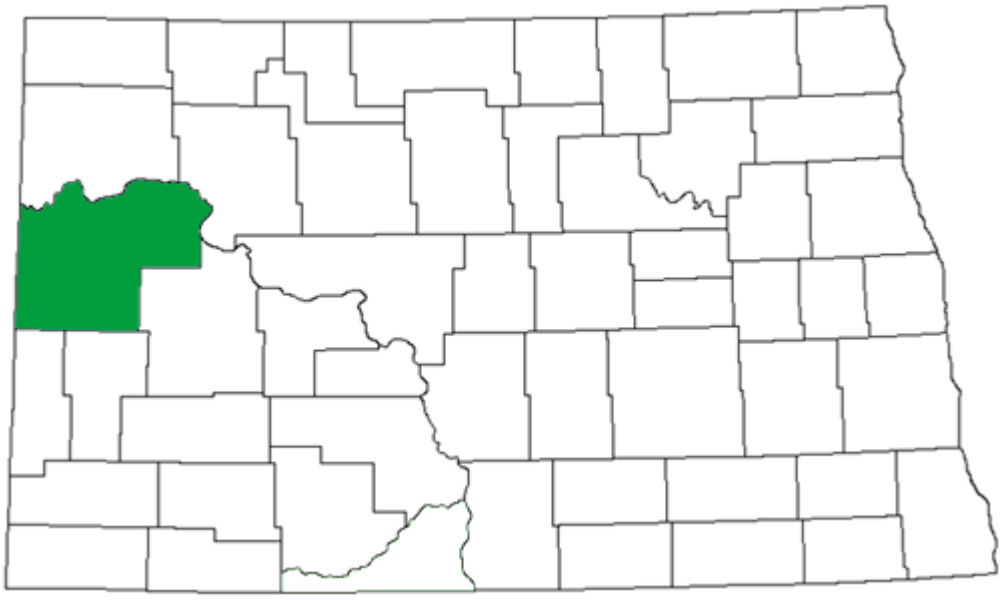


Figure 1. Location of McKenzie County in North Dakota.

elevation of Lake Sakakawea fluctuates seasonally from 1,825 to 1,854 feet (Carlson, 1985). Major drainages are the Missouri, Yellowstone, and Little Missouri Rivers.

Farming and ranching are the main economic enterprises in the county. The principal crops are dryland spring wheat, other small grains, canola, and grass-legume hay (NDAS, 2005). Selected areas are irrigated along the Yellowstone, Little Missouri, and Missouri Rivers and grow sugar beets, corn, and alfalfa. The McKenzie County Soil Conservation District serves the county and was organized in December of 1937.

The soils in the county vary widely. Soils on level to gently rolling areas are mostly moderately deep to deep and are either of glacial origin or derived from soft sedimentary residual bedrock. These soils are well suited for cropland. Soils on areas adjacent to the Little Missouri, Missouri, and Yellowstone rivers are shallow to very deep and hilly to very steep. Many soils are in complex with Badlands. These areas are best suited to rangeland. Soils in the river valleys are very deep and well suited to cropland. Many areas are irrigated.

The first soil survey of McKenzie County was published in the 1907 Soil Survey of McKenzie Area, North Dakota published in 1909 (Kocher and Stevens). An early reconnaissance survey of McKenzie County was included in the Soil Survey of Western North Dakota (Lapham, 1911). In the late 1930s, a soil survey was completed for the county at a scale of one inch equals one mile. This survey was done on a non-photographic base map (Edwards and Ableiter, 1942). A general soils map of the county was published by the North Dakota State Experiment Station (Patterson, et al., 1968). Detailed soil surveys for the Fort Berthold Indian Reservation and the Lewis and Clark Game Management Area in McKenzie County were completed in the early 1980s. The present soil survey provides additional information and larger scale photographic base maps and shows the soils in more detail.

About 35 percent of the county is cropland or pasture, 30 percent is privately owned native rangeland, 30 percent is federal land, and 5 percent is other land. The federal land is administered by the USDA-Forest Service, USDI-Bureau of Indian

Affairs, and USDI-National Park Service. Additional information related to agriculture in McKenzie County can be found in the Census of Agriculture (USDA-NASS, 1999).

Climate

The climate of McKenzie County is semi-arid to subhumid and continental. The area is usually quite warm in summer with frequent spells of hot weather and occasional cool days. It is very cold in winter, when arctic air frequently surges over the area. Most precipitation falls in late spring and early summer.

The table, "Temperature and Precipitation," gives data on temperature and precipitation for the survey area as recorded at Watford City, North Dakota, in the period of 1961 to 1990. The "Freeze Dates in Spring and Fall" table shows probable dates of the first freeze in fall and the last freeze in spring. The "Growing Season" table provides data on length of the growing season.

In January, the average temperature is 13 degrees F., and the average daily minimum temperature is 1 degree F. In July, the average temperature is 72 degrees F., and the average daily maximum temperature is 88 degrees F.

Growing degree days are shown in the "Temperature and Precipitation" table. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 15 inches. Of this, 12 inches, or 80 percent, usually falls in April through September. The growing season for commonly grown crops falls within this period. Rainfall amounts occurring in 2 years out or 10 are also shown in the first table. The information is useful in designing a management system for wet and dry years.

Average annual snowfall is about 35 inches. The average afternoon relative humidity in July is about 41 percent. The sun shines 76 percent of the time possible in July and 46 percent in November. The sun shines an average of 62 percent of the possible time annually. The prevailing wind is from the northwest. The average windspeed is 10 miles per hour (Jensen, 1971).

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, soil

scientists develop a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils (fig. 2). After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil Taxonomy, (Soil Survey Staff, 1999), and the system of taxonomic classification used in the United States, are based mainly on the kind and character of soil properties and the arrangement of horizons

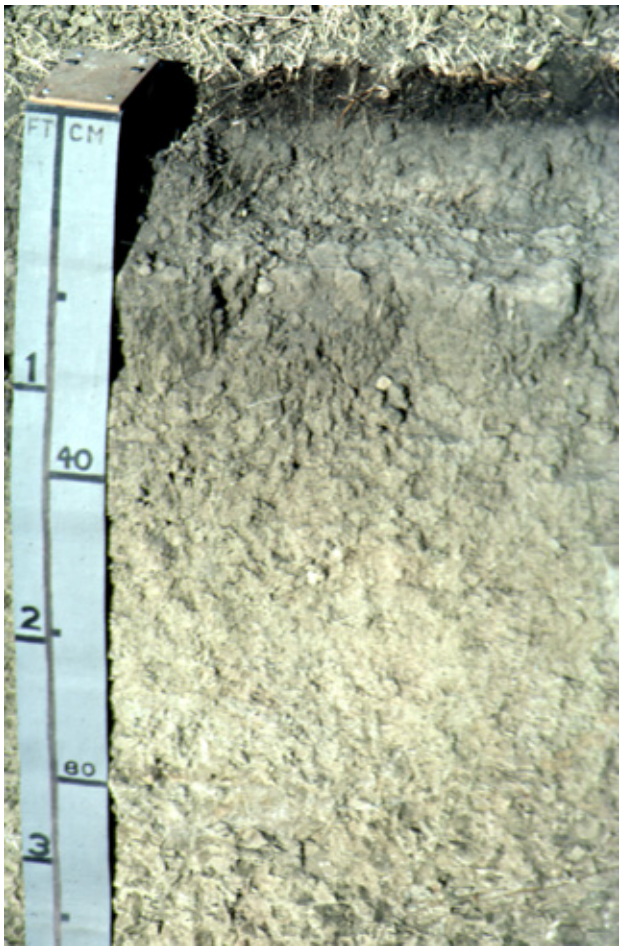


Figure 2. Profile of Janesburg silt loam. The dark brown and gray surface layers are underlain by a brown, dense, sodium affected subsoil.

within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

Survey Procedures

The general procedures used to make this survey are described in the National Soil Survey Handbook (Soil Survey Staff, 1996) and the Soil Survey Manual (Soil Survey Staff, 1993). The Major Soils of North Dakota (Omodt, et al, 1968), Soil Taxonomy (Soil Survey Staff, 1999), and Land Resources Regions and Major Land Resource Areas of the United States (USDA-SCS, 1981), were among the references used. The procedures used in determining the nature and characteristics of the soils are described under the heading “How This Survey was Made.”

All soil mapping was done on field sheets developed from high-altitude black and white aerial photographs from the National High Altitude Photography (NHAP) Program. The scale of the field sheets was 1:24,000 or 2.64 inches to the mile. Detail of these field sheets was checked with older aerial photography, color infrared photography, and in some instances, topographic maps. The soils maps are published on full quadrangle orthophotography.

Soil delineations were drawn on field sheets by traversing the land on foot, by pickup with mounted hydraulic soil probe, or by all-terrain vehicle. Traverses were planned to cross all major landforms and were at intervals close enough to locate contrasting soil areas of about 3 to 5 acres. Soils were examined to a depth of 3 to 5 feet, depending on the kind of soil. Soil properties, including color, texture, structure, horizonation, and presence of salts and stones were examined.

All map units were characterized for soil variability by transecting representative areas. A transect is a series of detailed soil examinations done in a map unit delineation to determine the range of composition of various kinds of soil and soil properties. One transect was required for each 1,000 acres of the unit mapped.

Data collected from the transects were used to determine map unit names and establish the range of composition of soil in each map unit. A statistical method explained by Brubaker and Hallmark (1991) was used for the analyses. This method predicts, at a 90 percent confidence level, the average composition in the county for each named map unit component and similar soil will be between the range given in the map unit description.

Each soil map unit was documented by at least one pedon description for each soil series identified in its name. Soil pedons were sampled for soil characterization or engineering test data. The soil analyses were made by the Natural Resources Conservation Service's Soil Survey Laboratory at Lincoln, Nebraska and the North Dakota State Department of Transportation's Materials and Research Laboratory.

Temperature and Precipitation

(Recorded in the period 1961-90 at Watford City, North Dakota.)

Month	Temperature						Precipitation			
				2 years in 10 will have		avg no. of		2 yrs in 10 will have		average number of
	avg daily max	avg daily min	avg	max temp. >than	min temp. <than	growing degree days*	avg (in.)	less than (in.)	more than (in.)	days with 0.10 inch or more
January	24.8	1.1	12.9	55	-37	3	0.37	0.10	0.59	1
February	32.0	8.2	20.1	58	-30	6	0.34	0.11	0.56	1
March	43.3	19.1	31.2	73	-15	43	0.57	0.23	0.90	1
April	58.7	30.9	44.8	87	5	200	1.46	0.51	2.24	3
May	71.1	42.4	56.7	94	23	499	2.27	0.80	3.49	4
June	80.6	51.6	66.1	99	35	726	3.01	1.81	4.10	6
July	88.0	56.7	72.4	105	41	966	2.13	1.06	3.06	4
August	87.3	54.2	70.7	104	36	947	1.62	0.49	2.53	3
September	74.5	43.5	59.0	99	20	558	1.65	0.61	2.51	3
October	62.4	33.3	47.9	86	10	269	1.02	0.26	1.75	2
November	42.7	19.1	30.9	72	-13	40	0.37	0.11	0.59	1
December	28.9	6.0	17.5	58	-34	2	0.41	0.19	0.62	1
Yearly :										
Average	57.8	30.5	44.2	—	—	—	-	-	-	-
Extreme	110	-45	--	107	-38	—	-	-	-	-
Total	-	-	-	—	—	4259	15.22	11.48	18.02	30

*** A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures,dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 40.0 deg. F)**

Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Watford City, North Dakota.)

Probability	Temperature		
	24F or lower	28F or lower	32F or lower
Last freezing temperature in spring :			
1 year in 10 later than—	May 7	May 16	June 2
2 year in 10 later than—	May 3	May 12	May 27
5 year in 10 later than—	April 26	May 4	May 14
First freezing temperature in fall :			
1 yr in 10 earlier than—	September 22	September 12	September 2
2 yr in 10 earlier than—	September 27	September 18	September 6
5 yr in 10 earlier than—	October 8	September 28	September 15

Growing Season

(Recorded in the period 1961-90 at Watford City, North Dakota.)

Probability	Daily Minimum Temperature		
	# days > 24F	# days > 28F	# days > 32F
9 years in 10	130	120	100
8 years in 10	137	126	108
5 years in 10	149	137	122
2 years in 10	161	147	136
1 year in 10	167	153	144

General Soil Map Units (STATSGO)

The general soil map which precedes the detailed soil maps was derived from STATSGO (State Soil Geographic Data Base). STATSGO (USDA-NRCS, 1994) is a small scale digital general soil map of North Dakota and an accompanying data base. It shows broad areas that have a distinctive pattern of soils, relief, and drainage. These similar areas are delineated into general soil map units or soil associations. Each soil association is a unique natural landscape. Typically, they consist of one or more major soils or components and some minor soils or components. The soils making up an association can occur in another association but in a different pattern. The STATSGO map can be used to compare the suitability of large areas for general land uses. Areas of soils suitable for a practice or use can be identified on the map. Likewise, areas that are not suitable can be identified. Broad interpretive groupings can be developed using STATSGO data. STATSGO maps are designed to be used primarily for multi-county and state resource evaluation and planning. Interpretive tables and maps can be prepared for North Dakota, or for smaller areas within the state. STATSGO maps can be used as part of a geographic information system (GIS).

The STATSGO map was compiled by generalizing more detailed soil survey maps. Information on the geology, topography, vegetation, and climate was also considered in the development of this map. The data base contains information on each association's acreage and composition. It also contains soil properties and interpretive data.

Maps were compiled at a scale of 1:250,000 (1 inch=4 miles). The smallest delineations are about 1,500 acres in size. STATSGO maps are prepared nationwide at the same scale and join across county and state boundaries. The maps meet national standards for mapping conventions and scale. Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Descriptions for STATSGO associations in McKenzie County begin on page 10. The composition of the named components in the association description includes soils that are similar in properties and behavioral patterns. Not all minor components are listed.

The North Dakota STATSGO map and data base are maintained by the USDA-NRCS Soils Staff in Bismarck, North Dakota. For more information on the use of STATSGO, or on the availability of interpretive tables and maps, contact the state NRCS office.

75—Williams-Zahl-Bowbells Association, level to gently rolling

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Williams	L	0-9	W	55-60
Zahl	L	3-9	W	15-20
Bowbells	L	0-6	W	10-15
MINOR COMPONENTS				
Bowdle	L	0-6	W	1-5
Parnell	SICL	0-1	VP	1-5
Tonka	SIL	0-1	P	1-5
Noonan	L	0-6	W	1-5

* L, loam; SIL, silt loam; SICL, silty clay loam
** VP, very poor; P, poor; W, well

Description

These soil areas consist of level to gently rolling topography with irregularly-shaped knolls separated by concave swales, drainageways, and broad flats. The dominant soils formed in medium to moderately fine textured glacial till. Most areas of this association are used for cultivated crops.

Williams soils occur on gentle, convex side slopes and broad, convex crests of knolls and ridges. Zahl soils occur on steeper, prominent knolls and ridges. Bowbells soils occur on concave side slopes, footslopes, and flats. Bowdle soils occur on flats and have a gravelly substratum that restricts root growth. Parnell and Tonka soils occur in depressions and potholes. Noonan soils occur on concave side slopes and have a dense, sodium affected suboil that restricts root growth. Zahl soils have a prominent “high lime” layer which occurs within plow depth. This light colored, limy material often is exposed and mixed with dark surface soil by cultivation.

Major Limitations for Agricultural Use

Wind and water erosion are concerns on some of the steeper areas. The poorly and very poorly drained soils generally have periods of wetness and ponding in the spring and after heavy rains. For additional information concerning these soils see “Detailed Map Unit Descriptions” and “Series Descriptions.” For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

76—Williams-Zahl Association, undulating to rolling

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Williams	L	3-15	W	50-55
Zahl	L	3-15	W	30-35
MINOR COMPONENTS				
Bowbells	L	0-6	W	5-10
Parnell	SIL	0-1	VP	5-10
Wabek	L	6-30	E	1-5

* L, loam; SIL, silt loam
** VP, very poor; W, well; E, excessive

Description

These soil areas consist of undulating to rolling topography with knolls, ridges, an occasional drainageway, and some depressions containing very poorly drained soils. The dominant soils formed in medium to moderately fine textured glacial till (fig. 3). Most areas of this association are used for cultivated crops with steeper areas used for rangeland.

Williams soils occur on convex and plane side slopes and broad, convex crests of knolls and ridges. Zahl soils occur on convex slopes and knolls and ridges. Bowbells soils occupy the swales and footslopes. Parnell soils occur in depressions and potholes. Wabek soils occur on knolls and some ridges. They have a gravelly substratum that restricts root growth. Zahl soils have a prominent "high lime" layer which occurs within plow depth. This light colored, limy material often is exposed and mixed with dark colored surface soil by cultivation.

Major Limitations for Agricultural Use

Wind and water erosion are concerns on some soils. The very poorly drained soils generally have periods of wetness and ponding in the spring and after heavy rains. Soils with a gravelly substratum are droughty. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

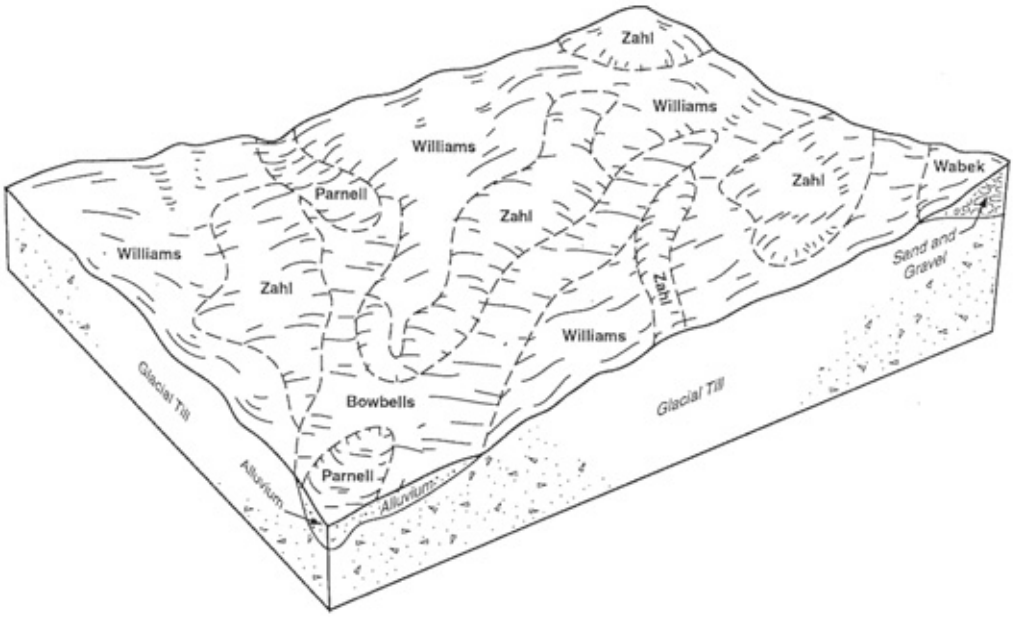


Figure 3. Typical pattern of soils and underlying material in the Williams-Zahl association.

77—Williams-Temvik-Wilton-Zahl Association, level to rolling

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Williams	L	0-15	W	30-35
Temvik	SIL	0-9	W	20-25
Wilton	SIL	1-3	W	15-20
Zahl	L	3-15	W	10-15
MINOR COMPONENTS				
Cabba	L	15-35	W	1-5
Sen	SIL	6-9	W	1-5
Tally	FSL	0-9	W	1-5

* L, loam; SIL, silt loam; FSL, fine sandy loam
** W, well

Description

These soil areas consist of level to rolling topography with flats, fans, rises, knolls, and ridges. The dominant soils formed in medium to moderately fine textured glacial till and loess (fig. 4). Most areas of this association are used for cultivated crops.

Williams soils occur on convex side slopes and broad convex crests of knolls and ridges. Temvik soils occur on flats and flootslopes of ridges. Wilton soils occur on linear flats. Zahl soils occur on convex slopes and knolls and ridges. Cabba soils occur on convex rises and shoulders of ridges. Sen soils occur on convex backslopes on rises and ridges. Tally soils occur on alluvial flats and fans. Zahl soils have a pominent “high lime” layer which occurs within plow depth. This light colored, limy material often is exposed and mixed with dark colored surface soil by cultivation.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Wind erosion is a concern on moderately coarse soils and soils with a “high lime” layer. Droughtiness, due to restricted root growth, is a concern on upland soils. For additional information concerning these soils see “Detailed Map Unit Descriptions” and “Series Descriptions.” For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

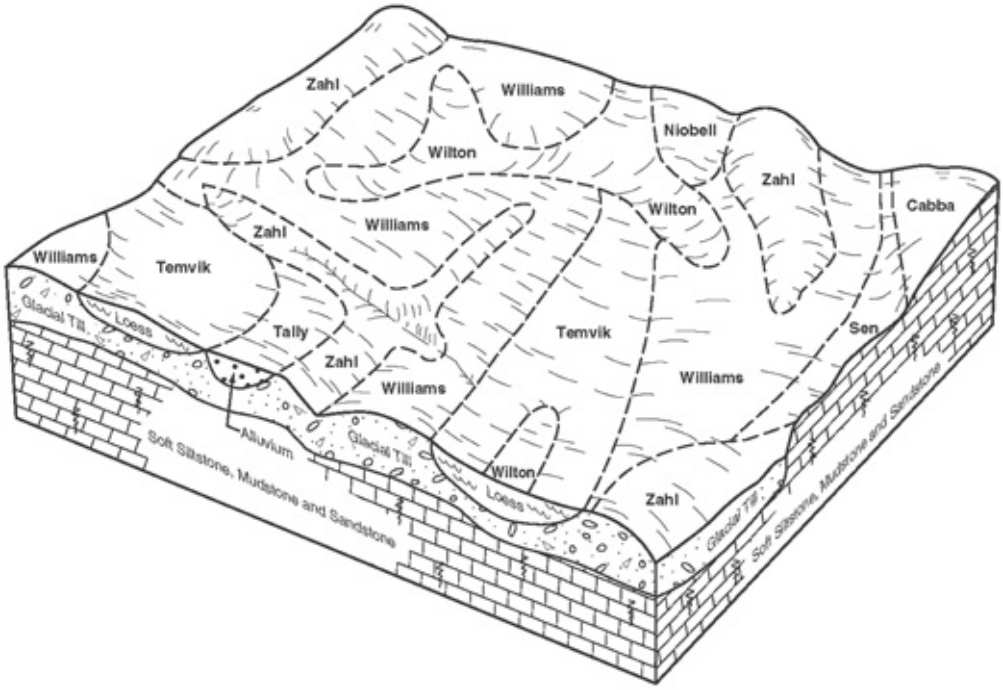


Figure 4. Typical pattern of soils and underlying material in the Williams-Temvik-Wilton-Zahl association.

82–Zahl-Williams-Cabba Association, undulating to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Zahl	L	3-60	W	20-25
Williams	L	3-25	W	20-25
Cabba	L	9-65	W	15-20
MINOR COMPONENTS				
Wilton	SIL	1-9	MW	10-15
Harriet	L	0-1	P	5-10
Parshall	FSL	1-3	W	5-10
Cherry	L	0-9	W	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam
** P, poor; MW, moderately well; W, well

Description

These soil areas consist of undulating to very steep topography with strongly dissected slopes bordering stream valleys and drainageways. The dominant soils formed in medium textured glacial till or mudstone bedrock. Most areas of this association are used for rangeland.

Zahl soils occur on steep prominent knolls and ridges. Williams soils occur on convex side slopes and broad convex crests of knolls and ridges. Cabba soils occur on steep ridges where the bedrock is close to the surface. Wilton soils occur on stable summits. The poorly drained Harriet soils occur in drainageways. Parshall soils occur in swales. Cherry soils occur on fans below steep ridges.

Major Limitations for Agricultural Use

Water erosion and surface runoff are concerns on these areas. Very steep slopes limit use for cultivated crops. For additional information concerning these soils see “Detailed Map Unit Descriptions” and “Series Descriptions.” For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

98—Cabba-Brandenburg-Dogtooth Association, gently rolling to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Cabba	L	6-70	W	25-30
Brandenburg	CN-L	6-70	E	25-30
Dogtooth	SIL	6-25	W	20-25
MINOR COMPONENTS				
Sen	SIL	3-25	W	10-15
Straw	L	0-6	W	1-5
Savage	SICL	0-25	W	1-5
Vebar	FSL	1-15	W	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam; SICL, silty clay loam; CN-L, channery loam
** W, well; E, excessive

Description

These soil areas consist of gently rolling to very steep uplands with flood plains, fans, flats, hills, ridges, and rises. The dominant soils formed in medium to fine textured alluvium and residuum. Most areas of this association are used for rangeland. Lesser sloping areas are used for cultivated crops.

Cabba soils occur on convex shoulders on ridges. Brandenburg soils occur on summits and shoulders of hills and ridges. They have a scoria substratum that restricts root growth. Dogtooth soils occupy micro-lows on flats, fans, and side slopes. They have a dense, sodium affected subsoil that restricts root growth. Sen and Vebar soils occur on convex and linear backslopes and shoulders on rises and ridges. Straw soils occur on flood plains. Savage soils occur on fans and footslopes.

Major Limitations for Agricultural Use

Water erosion is a concern on steep areas. Wind erosion is a concern on moderately coarse textured soils. Droughtiness, due to restricted root growth, is a concern on upland soils and sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

100—Cabba-Dogtooth-Amor Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Cabba	L	9-70	W	30-35
Dogtooth	SIL	0-25	W	25-30
Amor	L	3-25	W	15-20
MINOR COMPONENTS				
Farnuf	L	1-15	W	5-10
Badland, outcrop	--	9-150	--	1-5
Havrelon	SIL	0-6	W	1-5
Belfield	SICL	0-6	W	1-5

* L, loam; SIL, silt loam; SICL, silty clay loam
** W, well

Description

These soil areas consist of level to very steep rises and ridges, with some flood plains, flats, and fans. The dominant soils formed in medium to fine textured residuum. Most areas are used for rangeland. Lesser sloping areas are used for cropland.

Cabba soils occur on rises and shoulders on ridges. Dogtooth and Amor soils occur on pediments and backslopes of ridges. Belfield and Farnuf soils occur on fans, flats, and footslopes of ridges. Dogtooth and Belfield soils have a dense, sodium affected subsoil that restricts root growth. Badland, outcrop occurs on barren side slopes of ridges. Havrelon soils occur on flood plains.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Droughtiness, due to restricted root growth, is a concern on sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

101—Zahl-Williams-Tally Association, level to rolling

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Zahl	L	3-15	W	30-35
Williams	L	0-15	W	30-35
Tally	FSL	3-15	W	10-15
MINOR COMPONENTS				
Daglum	L	0-6	W	1-5
Dogtooth	SIL	0-25	W	1-5
Harriet	SIL	0-2	P	1-5
Lawther	SIC	0-2	W	1-5

* L, loam; SIL, silt loam; FSL, fine sandy loam; SIC, silty clay
** P, poor; W, well

Description

These soil areas consist of level to rolling topography with knolls, ridges, alluvial fans, and an occasional drainageway. The dominant soils formed in medium to moderately fine textured glacial till and moderately coarse to coarse textured alluvium. Most areas of this association are used for cultivated crops with steeper areas used for rangeland.

Zahl soils occur on convex slopes and knolls and ridges. Williams soils occur on convex and plane side slopes and broad, convex crests of knobs and ridges. Tally soils occur on plane side slopes and alluvial fans. Daglum soils occur on micro-highs on flats and alluvial fans. Dogtooth soils occur on flats and fans. Harriet soils occur in drainageways. Daglum, Dogtooth, and Harriet soils have a dense, sodium affected subsoil that restricts root growth. Lawther soils occur on alluvial flats and fans. Zahl soils have a prominent “high lime” layer which occurs within plow depth. This light colored, limy material often is exposed and mixed with dark surface soil by cultivation.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Wind erosion is a concern on the moderately coarse and fine textured soils. Droughtiness, due to restricted root growth, is a concern on steeper uplands and on sodium affected soils. For additional information concerning these soils see “Detailed Map Unit Descriptions” and “Series Descriptions.” For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

102—Cabba-Badland, outcrop-Cherry Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Cabba	L	9-70	W	40-45
Badland, outcrop	Variable	9-120	--	15-20
Cherry	SIL	0-25	W	10-15
MINOR COMPONENTS				
Amor	L	3-25	W	5-10
Zahl	L	9-60	W	5-10
Vebar	FSL	9-40	W	1-5
Rhoades	SIL	1-15	W	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam
** W, well

Description

These soil areas occupy very steep “breaks” along the Missouri River and its tributaries. The dominant soils formed in medium to moderately fine textured bedrock. Most areas of this association are used for rangeland or wildlife.

Cabba and Zahl soils occur on convex slopes on summits and shoulders. Badland, outcrop is on steep south-facing side slopes and is barren of vegetation. Cherry soils occur on convex linear alluvial fans and footslopes. Amor and Vebar soils occur on strongly sloping side slopes and summits. Rhoades soils occur on footslopes and in swales. They have a dense, sodium affected subsoil that restricts root growth.

Major Limitations for Agricultural Use

Water erosion and surface runoff are concerns on these areas. Steep slopes limit use for cultivated crops. For additional information concerning these soils see “Detailed Map Unit Descriptions” and “Series Descriptions.” For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

103—Cabba-Williams-Straw Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Cabba	L	9-70	W	30-40
Williams	L	3-15	W	25-30
Straw	L	0-3	W	10-15
MINOR COMPONENTS				
Zahl	L	6-60	W	5-10
Ringling	CN-L	2-35	E	1-15
Grail	SICL	0-6	W	1-5
Daglum	L	0-9	W	1-5

* L, loam; SICL, silty clay loam; CN-L, channery loam
** W, well; E, excessive

Description

These soil areas consist of level to very steep topography with strongly dissected slopes bordering stream valleys and drainageways. The dominant soils formed in medium textured mudstone bedrock, glacial till, or alluvium. Most areas of this association are used for rangeland.

Cabba soils occur on steep ridges where the bedrock is close to the surface. Williams soils occur on convex side slopes and broad convex crests of knolls and ridges. Straw soils occur on flats on flood plains. Zahl soils occur on steep prominent knolls and ridges. Ringling soils occur on convex rises. They are underlain with scoria. Grail soils occur on concave toeslopes and in swales. Daglum soils occur in micro-lows on toeslopes.

Major Limitations for Agricultural Use

Water erosion and surface runoff are concerns on these areas. Very steep slopes limit use for cultivated crops. For additional information concerning these soils see “Detailed Map Unit Descriptions” and “Series Descriptions.” For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

105—Chama-Golva-Cabba Association, nearly level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Chama	SIL	3-15	W	25-30
Golva	SIL	1-6	W	20-25
Cabba	L	6-45	W	20-25
MINOR COMPONENTS				
Belfield	SIL	0-9	W	5-10
Moreau	SIC	0-9	W	5-10
Rhoades	SIL	1-9	W	5-10
Vebar	FSL	3-15	W	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam; SIC, silty clay
** W, well

Description

These soil areas consist of nearly level to very steep uplands with flats, fans, hills, rises, and ridges. The dominant soils formed in medium textured residuum and alluvium. Most areas of the association are used for cultivated crops with steeper areas used for rangeland.

Chama, Moreau, and Vebar soils occur on convex backslopes on rises and ridges. Chama soils have a prominent “high lime” layer which occurs within plow depth. This light colored, limy material often is exposed and mixed with dark surface soil by cultivation. Golva, Belfield, and Rhoades soils occur on alluvial flats and fans. Rhoades soils occupy micro-lows and have a dense, sodium affected subsoil that restricts root growth. Cabba soils occur on convex rises and shoulders on ridges.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Wind erosion is a concern on moderately coarse textured soils and the soils with a “high lime” layer. Droughtiness, due to restricted root growth, is a concern on upland and sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

107—Daglum-Belfield-Rhoades-Harriet Association, level to gently rolling

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Daglum	L	0-6	W	25-30
Belfield	SIL	0-6	W	15-20
Rhoades	L	0-9	W	10-15
Harriet	SIL	0-3	P	10-15
MINOR COMPONENTS				
Korchea	L	0-3	W	10-15
Farnuf	L	0-9	W	5-10
Regent	SICL	0-6	W	1-5

* L, loam; SIL, silt loam; SICL, silty clay loam
** P, poor; W, well

Description

These soil areas consist of level to gently rolling topography with flats, fans, rises, terraces, and drainageways. The dominant soils formed in fine textured alluvium. Most areas of this association are used for cultivated crops.

Daglum, Belfield, Rhoades, and Farnuf soils occur on flats and fans. Rhoades soils occupy micro-lows and Daglum soils occupy micro-highs. The Daglum, Harriet, and Rhoades soils have a dense, sodium affected subsoil that restricts root growth. Harriet and Korchea soils occur on terraces and in drainageways. Harriet soils occupy lower lying positions. Regent soils occur on convex rises.

Major Limitations for Agricultural Use

Droughtiness, due to restricted root growth, is a concern on sodium affected soils. The poorly drained soils generally have wetness and ponding in the spring and after heavy rains. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

108—Flasher-Vebar-Parshall Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Flasher	LFS	15-45	SE	20-25
Vebar	FSL	3-15	W	15-20
Parshall	FSL	0-6	W	10-15
MINOR COMPONENTS				
Beisigl	LFS	6-20	SE	5-10
Havrelon	SIL	0-6	W	5-10
Savage	SIL	1-3	W	5-10
Shambo	L	3-6	W	5-10

* FSL, fine sandy loam; L, loam; LFS, loamy fine sand; SIL, silt loam
** W, well; SE, somewhat excessive

Description

These soil areas consist of level to very steep uplands with fans, flats, hills, and ridges dissected by drainageways, terraces, and flood plains. The dominant soils formed in moderately coarse to coarse textured alluvium and sandstone residuum. Most areas of this association are used for rangeland. Lesser sloping areas are used for cultivated crops.

Flasher soils occur on shoulders of hills and ridges. Vebar and Beisigl soils occur on convex backslopes and footslopes of hills and ridges. Parshall, Savage, and Shambo soils occur on terraces, footslopes, fans, and flats. Havrelon soils occur on flood plains.

Major Limitations for Agricultural Use

Water erosion is a concern on steep areas. Wind erosion is a concern on coarse and moderately coarse textured soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

115—Straw-Velva Association, level to undulating

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Straw	L	0-3	W	50-55
Velva	FSL	1-6	W	5-10
MINOR COMPONENTS				
Belfield	SIL	1-3	W	5-10
Parshall	FSL	1-6	W	5-10
Vebar	FSL	6-15	W	5-10
Cabba	L	3-45	W	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam
** W, well

Description

These soil areas consist of level to undulating stream terraces and flood plains and adjacent fans, flats, and escarpments. The dominant soils formed in moderately coarse to medium textured fluvial deposits. Most areas of this association are used for cultivated crops with steeper escarpments used for rangeland.

Straw and Velva soils occur on stream terraces and flood plains. Belfield soils occur on flats. Parshall soils occur on terraces and fans. Vebar soils occur on rises on backslopes of ridges. Cabba soils occur on shoulders of ridges.

Major Limitations for Agricultural Use

Wind erosion is a concern on moderately coarse textured soils. Water erosion is a concern on steeper areas. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

119—Havrelon-Lohler Association, level and nearly level

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Havrelon	L	0-3	W	40-45
Lohler	SIC	0-3	MW	35-40
MINOR COMPONENTS				
Banks	FSL	0-6	SE	1-5
Lallie	SIC	0-2	P	5-10
Scorio, saline	SIC	0-3	MW	5-10
Trembles	FSL	0-4	W	1-5

* FSL, fine sandy loam; L, loam; SIC, silty clay
** P, poor; MW, moderately well; W, well; SE, somewhat excessive

Description

These soil areas consist of level and nearly level flood plains. The dominant soils formed in medium and fine textured fluvial deposits (fig. 5). Most areas of this association are used for cultivated crops.

Havrelon and Trembles soils occur on flats. Lohler soils occur on slightly lower flats. Banks soils occur on rises on levees. Lallie soils are poorly drained and occur in depressions and abandoned channels. Scorio, saline, soils occur on lower flats, are moderately saline, and have a seasonal water table.

Major Limitations for Agricultural Use

Wind erosion is a concern on these areas. Wetness may be a concern on some soils. Some of these soils flood in years of high water. For additional information concerning these soils see “Detailed Map Unit Descriptions” and “Series Descriptions.” For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

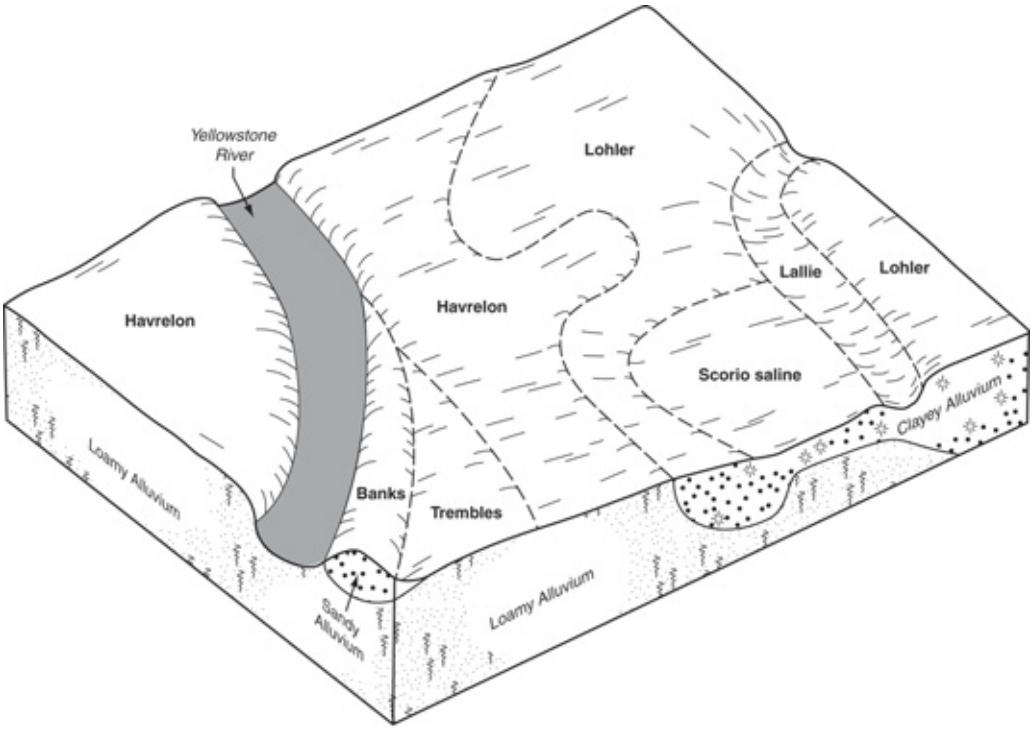


Figure 5. Typical pattern of soils and underlying material in the Havrelon-Lohler association.

126—Janesburg-Dogtooth-Cabba Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Janesburg	SIL	0-25	W	25-30
Dogtooth	SIL	0-25	W	25-30
Cabba	L	6-70	W	10-15
MINOR COMPONENTS				
Chama	SIL	3-45	W	5-10
Belfield	SIL	0-6	W	5-10
Vebar	FSL	1-65	W	5-10
Flasher	LFS	9-70	SE	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam; LFS, loamy fine sand
* W, well; SE, somewhat excessive

Description

These soil areas consist of level to very steep uplands with fans, hills, rises, and ridges. The dominant soils formed in medium to fine textured residuum. Most areas of this association are used for rangeland. Lesser sloping areas may be used for cultivated crops.

The Janesburg soils occur on micro-highs and the Dogtooth soils occupy micro-lows on fans and side slopes of ridges. They have a dense, sodium affected subsoil that restricts root growth. Cabba and Flasher soils occur on convex shoulders on ridges. Chama and Vebar soils occur on backslopes and shoulders on rises and ridges. Belfield soils occur on fans.

Major Limitations for Agricultural Use

Water erosion is a concern on steep areas. Wind erosion is a concern on moderately coarse and coarse textured soils. Droughtiness, due to restricted root growth, is a concern on uplands and sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

138—Glendive-Havre-Hanly Association, level to undulating

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Glendive	FSL	0-6	W	20-25
Havre	SIL	0-3	W	20-25
Hanly	FSL	0-6	SE	10-15
MINOR COMPONENTS				
Chanta	L	1-6	W	10-15
Lonna	SIL	1-9	W	10-15
Cabbart	SIL	9-50	W	10-15
Badland, outcrop	--	9-150	--	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam
** W, well; SE, somewhat excessive

Description

These soil areas consist of level to undulating flood plains with some fans, terraces, and ridges found along the Little Missouri River (fig. 6). The dominant soils formed in moderately coarse to medium textured alluvium. Most areas of this association are used for rangeland or hayland.

Glendive, Havre, and Hanly soils occur on flood plains. Chanta soils occur on terraces. Lonna soils occur on fans. Cabbart soils occur on shoulders of ridges. Badland outcrop occurs on barren side slopes of ridges.

Major Limitations for Agricultural Use

Wind erosion is a concern on the moderately coarse textured soils. Water erosion is a concern on steeper areas. Flooding is a concern on the dominant soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

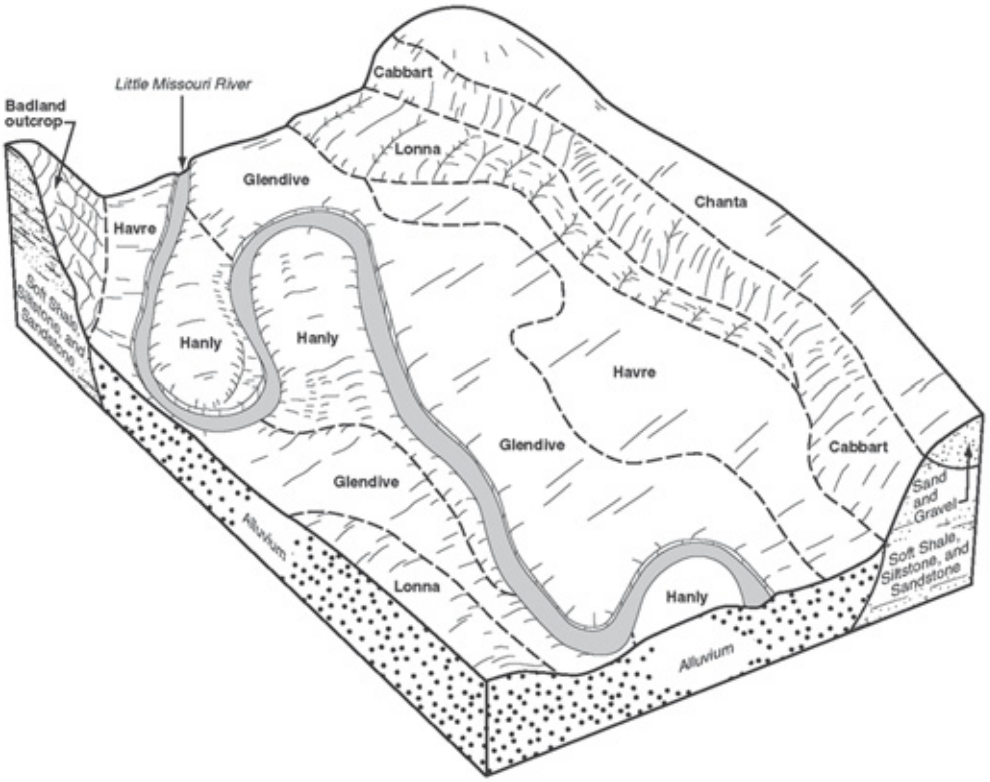


Figure 6. Typical pattern of soils and underlying material in the Glendive-Havre-Hanly association.

147—Lambert-Cabba-Cherry Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Lambert	SIL	2-15	W	40-45
Cabba	SIL	15-65	W	20-25
Cherry	SICL	0-15	W	10-15
MINOR COMPONENTS				
Shambo	L	0-8	W	5-10
Vebar	FSL	2-25	W	1-5
Havrelon	SIL	0-4	W	1-5

* L, loam; SIL, silt loam; FSL, fine sandy loam; SICL, silty clay loam
** W, well

Description

These soil areas consist of level to very steep uplands with ridges, fan, terraces, and floodplains. The dominant soils formed in medium textured residuum and alluvium. Most areas of this association are used for rangeland.

Lambert and Cherry soils occur on fans. Cabba soils occur on shoulders of ridges. Shambo soils occur on terraces and footslopes. Vebar soils occur on side slopes and summits. Havrelon soils occur on floodplains.

Major Limitations for Agricultural Use

Water erosion and surface runoff are concerns on these areas. Very steep slopes limit use for cultivated crops. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

158—Cabba-Cherry Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Cabba	SIL	6-70	W	30-35
Cherry	SIL	0-25	W	25-30
MINOR COMPONENTS				
Chama	SIL	3-45	W	5-10
Farnuf	L	2-25	W	5-10
Dogtooth	SIL	0-25	W	5-10
Vebar	FSL	3-25	W	1-5
Badland, outcrop	Variable	9-150	--	1-5

* L, loam; SIL, silt loam; FSL, fine sandy loam
** W, well

Description

These soil areas consist of level to very steep topography with flats, fans, rises, and ridges. The dominant soils formed in medium textured residuum and alluvium. Most areas of this association are used for rangeland. Lesser sloping areas are used for cultivated crops.

Cabba soils occur on convex shoulders on ridges. Cherry and Farnuf soils occur on alluvial flats, fans, and footslopes. Chama soils occur on convex backslopes on rises and ridges. They have a prominent “high lime” layer which occurs within plow depth. The light-colored, limy material often is exposed and mixed with dark surface soil by cultivation. Dogtooth soils occur on micro-lows on flats and fans. Vebar soils occur on convex and linear backslopes and shoulders on rises and ridges. Badland, outcrop occurs on barren side slopes of ridges.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Wind erosion is a concern on moderately coarse textured soils and the soils with a “high lime” layer. Droughtiness, due to restricted root growth, is a concern on sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

160—Rhame-Fleak Association, gently rolling to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Rhame	FSL	6-50	W	40-45
Fleak	LFS	6-50	SE	25-30
MINOR COMPONENTS				
Boxwell	L	0-50	W	5-10
Arikara	SPM	9-70	W	5-10
Badland, outcrop	--	9-150	--	1-5
Havre	SIL	0-3	W	1-5
Scairt	SIL	6-15	W	1-5

* FSL, fine sandy loam; L, loam; LFS, loamy fine sand; SIL, silt loam; SPM, slightly decomposed plant material
** W, well; SE, somewhat excessive

Description

These soil areas consist of gently rolling to very steep fans and ridges with some flood plains. The dominant soils formed in coarse to moderately coarse textured residuum. Most areas of this association are used for rangeland. Lesser sloping areas are used for cultivated crops.

Rhame and Boxwell soils occur on backslopes of ridges and on pediments. Fleak soils occur on shoulders of ridges. Arikara soils occur on footslopes and backslopes of ridges. Badland, outcrop occurs on barren side slopes of ridges. Havre soils occur on flood plains. Scairt soils occur in micro-lows on footslopes and backslopes of ridges. They have a dense, sodium affected subsoil that restricts root growth.

Major Limitations for Agricultural Use

Water erosion is a concern on steep areas. Wind erosion is a concern on coarse and moderately coarse textured soils. Droughtiness, due to restricted root growth, is a concern on sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

163—Dooley-Zahl-Williams Association, level to rolling

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Dooley	FSL	0-15	W	35-40
Zahl	L	0-15	W	20-25
Williams	L	0-15	W	10-15
MINOR COMPONENTS				
Daglum	L	0-6	W	5-10
Belfield	SICL	0-6	W	1-5
Beisigl	LFS	0-15	SE	1-5
Grail	SICL	0-6	W	1-5

* FSL, fine sandy loam; L, loam; LFS, loamy fine sand; SICL, silty clay loam
** W, well; SE, somewhat excessive

Description

These soil areas consist of level to rolling topography with knolls, ridges, flats, fans, and hills. The dominant soils formed in medium to fine textured glacial till. Most areas of this association are used for cultivated crops with steeper areas used for rangeland.

Dooley and Williams soils occur on convex and plane side slopes and broad convex crests of knobs and ridges. Zahl soils occur on convex slopes and knolls and ridges. Belfield and Daglum soils occur on flats and fans. These soils have a dense, sodium affected subsoil that restricts root growth. Beisigl soils ocur on backslopes and footslopes of hills and ridges. Grail soils occupy the swales and footslopes. The Zahl soils have a prominent “high lime” layer which occurs within plow depth. This light colored, limy material often is exposed and mixed with dark colored surface soil by cultivation.

Major Limitations for Agricultural Use

Water erosion is a concern on steep areas. Wind erosion is a concern on the moderately coarse soils. Droughtiness, due to restricted root growth, is a concern on the steep upland soils and the sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

169—Zahl-Williams Association, undulating to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Zahl	L	3-45	W	50-55
Williams	L	3-15	W	35-40
MINOR COMPONENTS				
Parnell	SICL	0-1	VP	5-10
Niobell	L	0-6	W	1-5
Wabek	L	6-25	E	1-5

* L, loam; SICL, silty clay loam
** VP, very poor; W, well; E, excessive

Description

These soil areas consist of undulating to very steep topography with knolls, ridges, an occasional drainageway, and some very poorly drained soils in depressions and potholes. The dominant soils formed in medium to moderately fine textured glacial till (fig. 7). Most areas of this association are used for rangeland. Lower sloping areas are used for cultivated crops.

Zahl and Wabek soils occur on convex slopes of knolls and ridges. Williams soils occur on side slopes and summits. The very poorly drained Parnell soils occupy depressions and potholes. Niobell soils occur on concave side slopes and have a sodium affected subsoil. Wabek soils have a gravelly substratum that restricts root growth.

Major Limitations for Agricultural Use

Water erosion is a concern on the dominant soils. Steep slopes and potholes limit use for cultivated crops in some areas. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

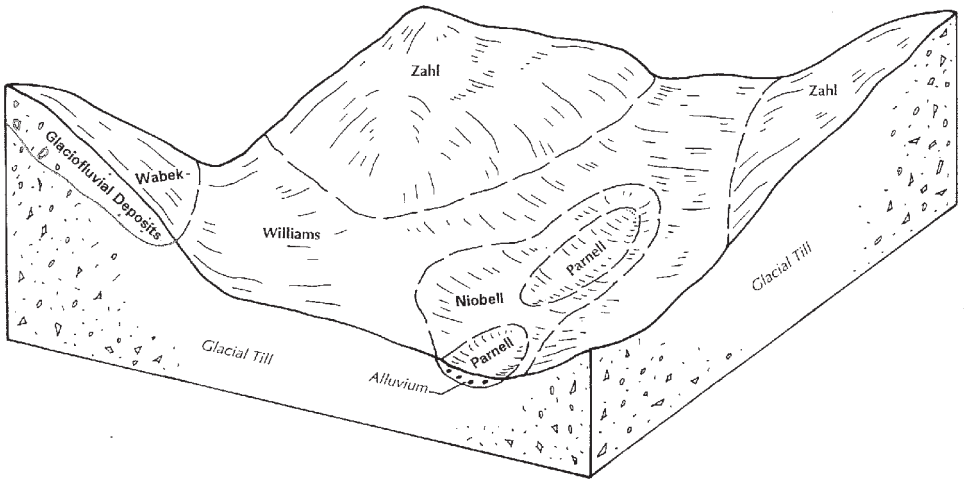


Figure 7. Typical pattern of soils and underlying material in the Zahl-Williams association.

173—Lawther-Shambo-Savage Association, level to undulating

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Lawther	SIC	0-3	W	25-30
Shambo	L	0-3	W	20-25
Savage	SICL	0-6	W	20-25
MINOR COMPONENTS				
Farland	SIL	0-6	W	10-15
Korchea	L	0-3	W	10-15
Tally	SL	0-6	W	1-5
Trembles	SL	0-3	W	1-5

* SL, sandy loam; L, loam; SIL, silt loam; SICL, silty clay loam; SIC, silty clay
** W, well

Description

These soil areas consist of level to undulating alluvial plains. The dominant soils are medium and fine textured (fig. 8). Most areas of this association are used for cultivated crops.

Lawther and Savage soils occur on broad, slightly depressed flats. Shambo and Farland soils occur on broad, slightly elevated flats. Korchea and Trembles soils occur on flood plains. Tally soils occur on side slopes.

Major Limitations for Agricultural Use

Wind erosion and flooding are concerns on some soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

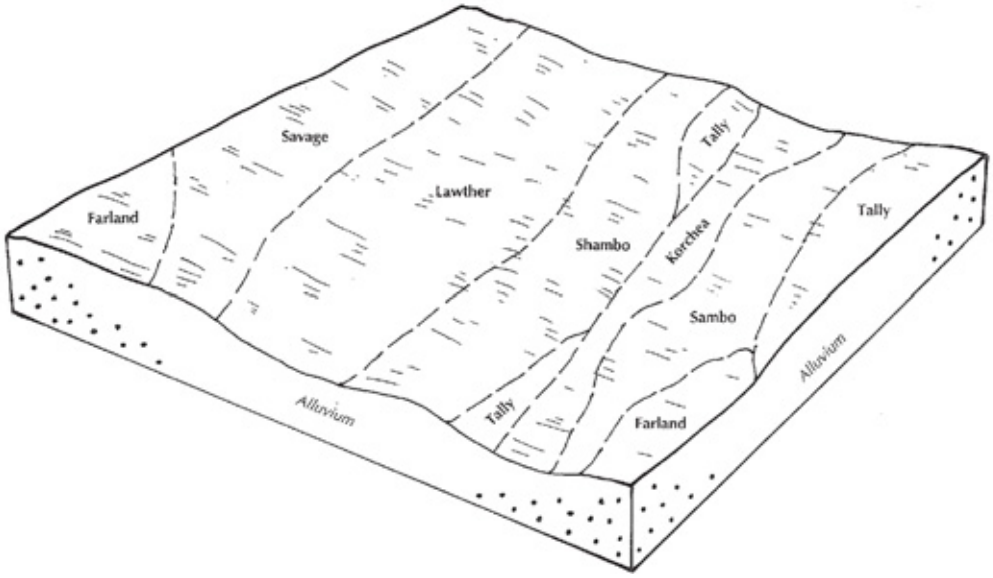


Figure 8. Typical pattern of soils and underlying material in the Lawther-Shambo-Savage association.

174—Maschetah-Cherry Association, level to hilly

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Maschetah	SIL	0-9	W	55-60
Cherry	SIL	2-25	W	10-15
MINOR COMPONENTS				
Cabba	SIL	6-70	W	5-10
Chama	SIL	6-45	W	5-10
Korchea	L	0-6	W	5-10
Savage	SICL	0-6	W	5-10

* L, loam; SIL, silt loam; SICL, silty clay loam
** W, well

Description

These soil areas consist of level to hilly uplands with flats, fans, hills, rises, and ridges. The dominant soils formed in medium textured alluvium. Most areas of this association are used for cultivated crops with steeper areas used for rangeland.

Maschetah, Cherry, and Savage soils occur on alluvial flats, fans, and footslopes. Cabba soils occur on convex rises and shoulders on ridges. Chama soils occur on convex backslopes on rises and ridges. They have a prominent “high lime” layer which occurs within plow depth. The light colored, limy material often is exposed and mixed with dark surface soil by cultivation. Korchea soils occur on floodplains.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Wind erosion is a concern on soils with a “high lime” layer. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

176—Patent-Badland, outcrop-Cabbart Association, nearly level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Patent	L	1-25	W	30-35
Badland, outcrop	--	9-150	--	20-25
Cabbart	L	6-70	W	15-20
MINOR COMPONENTS				
Arikara	SPM	15-70	W	1-5
Rhame	FSL	3-15	W	1-5
Gerda	SIL	0-9	W	1-5
Boxwell	L	1-50	W	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam; SPM, slightly decomposed plant material
** W, well

Description

These soil areas consist of nearly level to very steep fans and ridges with some flats (fig. 9). The dominant soils formed in medium textured alluvium and residuum. Most areas of this association are used for rangeland. Lesser sloping areas are used for cultivated crops.

Patent soils occur on fans. Badland, outcrop occurs on barren side slopes of ridges. Cabbart soils occur on shoulders of ridges. Arikara soils occur on backslopes and footslopes of ridges. Rhame and Boxwell soils occur on pediments or backslopes of ridges. Gerda soils occur in micro-lows on fans and flats. They have a dense, sodium affected subsoil that restricts root growth.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Wind erosion is a concern on moderately coarse textured soils. Droughtiness, due to restricted root growth, is a concern on sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

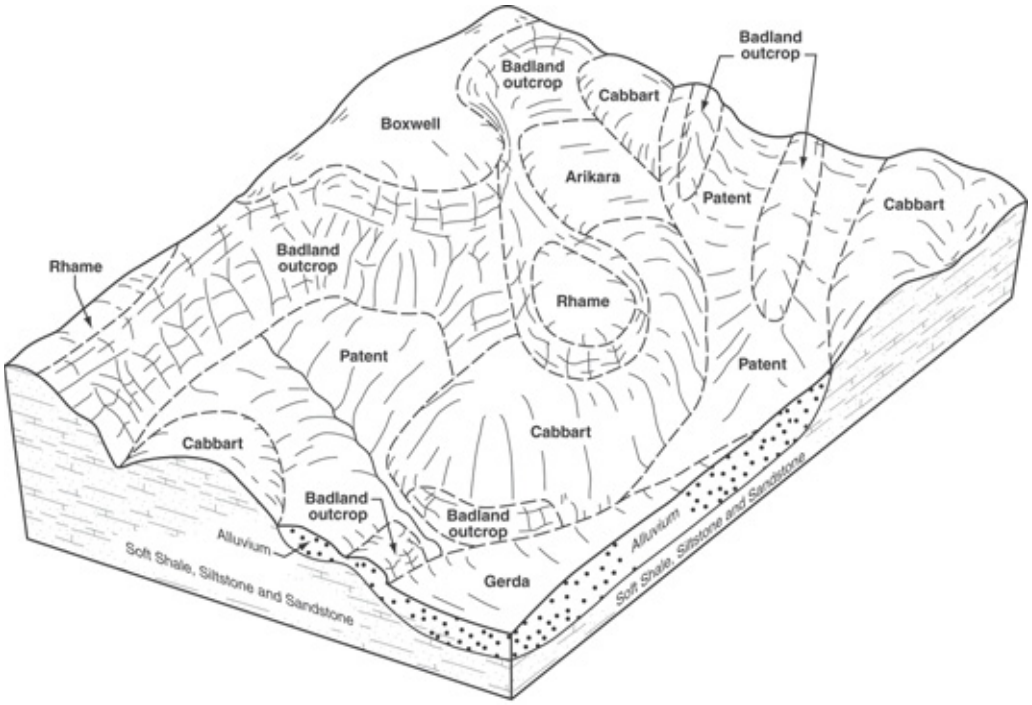


Figure 9. Typical pattern of soils and underlying material in the Patent-Badland, outcrop-Cabbart association.

177—Havre-Glendive Association, level and nearly level

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Havre	SIL	0-3	W	65-75
Glendive	FSL	0-3	W	15-20
MINOR COMPONENTS				
Badland, outcrop	--	9-150	--	1-5
Cabbart	SIL	3-50	W	1-5
Chanta	L	1-6	W	1-5
Lonna	SIL	3-15	W	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam
** W, well

Description

These soil areas consist of level and nearly level flood plains and terraces, with some fans and ridges. The dominant soils formed in moderately coarse to medium textured fluvial deposits. Most areas of this association are used for cultivated crops or rangeland.

Havre and Glendive soils occur on flood plains and terraces. Badland, outcrop occurs on barren side slopes of ridges. Cabbart soils occur on summits and shoulders of ridges. Chanta soils occur on terraces. Lonna soils occur on fans.

Major Limitations for Agricultural Use

Wind erosion is a concern on these soils. Water erosion is a concern on steeper areas. Droughtiness, due to low water holding capacity, is a concern on some soils. Flooding is a concern on the dominant soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

178—Boxwell-Scairt-Cabbart-Rhame Association, level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Boxwell	L	3-60	W	30-35
Scairt	SIL	0-15	W	15-20
Cabbart	L	6-70	W	15-20
Rhame	FSL	1-50	W	10-15
MINOR COMPONENTS				
Maltese	SIL	0-25	W	10-15
Arikara	SPM	3-45	W	5-10
Badland, outcrop	--	9-150	--	1-5

* FSL, fine sandy loam; L, loam; SIL, silt loam; SPM, slightly decomposed plant material
** W, well

Description

These soil areas consist of level to very steep fans, flats, and ridges. The dominant soils formed in moderate to fine textured residuum. Most areas of this association are used for rangeland.

Boxwell, Scairt, and Rhame soils occur on pediments and backslopes of ridges. Scairt soils occur on micro-lows. Cabbart soils occur on shoulders of ridges. Maltese soils occur on flats, fans, and footslopes of ridges. They have a dense, sodium affected subsoil that restricts root growth. Arikara soils occur on backslopes and footslopes of ridges. Badland, outcrop occurs on barren side slopes of ridges.

Major Limitations for Agricultural Use

Water erosion is a concern on steeper areas. Wind erosion is a concern on moderately coarse textured soils. Droughtiness, due to restricted root growth, is a concern on sodium affected soils. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

179—Lonna-Kirby-Scairt-Badland, outcrop Association, nearly level to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Lonna	SIL	1-25	W	30-35
Kirby	CNV-L	3-70	E	20-25
Scairt	SIL	1-15	W	10-15
Badland, outcrop	--	9-150	--	10-15
MINOR COMPONENTS				
Cabbart	SIL	6-70	W	5-10
Maltese	SIL	0-25	W	1-5
Boxwell	L	6-15	W	1-5

* L, loam; SIL, silt loam; CNV-L, very channery loam
** W, well; E, excessive

Description

These soil areas consist of nearly level to very steep flats, fans, hills, and ridges. The dominant soils formed in medium to fine textured alluvium and residuum. Most areas of this association are used for rangeland.

Lonna soils occur on footslopes of hills and fans. Kirby soils occur on shoulders of hills and ridges. They have a scoria substratum that restricts root growth. Scairt soils occur on micro-lows on pediments and backslopes of ridges. Badland, outcrop occurs on barren side slopes of ridges. Cabbart soils occur on shoulders of ridges. Maltese soils occur on micro-highs on flats. They have a dense, sodium affected subsoil that restricts root growth. Boxwell soils occur on backslopes of ridges.

Major Limitations for Agricultural Use

Water erosion is a concern on steep areas. Droughtiness, due to restricted root growth, is a concern on sodium affected soils and soils with scoria substratums. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

193—Badland, outcrop-Cabbart-Arikara Association, gently rolling to very steep

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Badland, outcrop	--	9-150	--	20-25
Cabbart	L	6-70	W	20-25
Arikara	SPM	9-70	W	15-20
MINOR COMPONENTS				
Haydraw	SIL	0-9	W	10-15
Patent	L	1-30	W	10-15
Boxwell	L	6-60	W	5-10

* L, loam; SIL, silt loam; SPM, slightly decomposed plant material
** W, well

Description

These soil areas consist of gently rolling to very steep ridges with some flats and fans. The dominant soils formed in medium textured alluvium and residuum. Most areas of this association are used for rangeland or wildlife.

Badland, outcrop occurs on barren side slopes of ridges. Cabbart soils occur on shoulders of ridges. Arikara soils occur on backslopes and footslopes of ridges. Haydraw and Patent soils occur on flats and fans. Boxwell soils occur on backslopes of ridges.

Major Limitations for Agricultural Use

Water erosion is a concern on steep areas. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

194—Janesburg-Dogtooth Association, level to hilly

	SURFACE TEXTURE*	SLOPE PERCENT	DRAINAGE**	PERCENT COMPOSITION
MAJOR COMPONENTS				
Janesburg	SIL	0-25	W	40-45
Dogtooth	SIL	0-25	W	25-30
MINOR COMPONENTS				
Sen	SIL	0-15	W	10-15
Cabba	SIL	6-35	W	5-10
Vebar	FSL	1-15	W	5-10
Belfield	SIL	0-6	W	1-5
Harriet	SIL	0-3	P	1-5

* FSL, fine sandy loam; SIL, silt loam
** P, poor; W, well

Description

These soil areas consist of level to hilly flats, fans, and some drainageways, rises, and ridges (fig. 10). Most areas are used for cultivated crops with steeper areas used for rangeland.

The Janesburg, Dogtooth, Sen, and Vebar soils occur on pediments and backslopes of ridges. Janesburg soils occur on micro-highs. Dogtooth soils occur on micro-lows. Cabba soils occur on shoulders of ridges. Belfield soils occur on flats and fans. Harriet soils occur in drainageways. Janesburg, Dogtooth, Belfield, and Harriet soils have a dense, sodium affected subsoil that restricts root growth.

Major Limitations for Agricultural Use

Droughtiness, due to restricted root growth, is a concern on sodium affected soils. Water erosion is a concern on steeper areas. The poorly drained soils generally have periods of wetness and ponding in the spring and after heavy rains. For additional information concerning these soils see "Detailed Map Unit Descriptions" and "Series Descriptions." For information concerning the limitations for agriculture see the “Potential Cropland Limitations and Hazards” table.

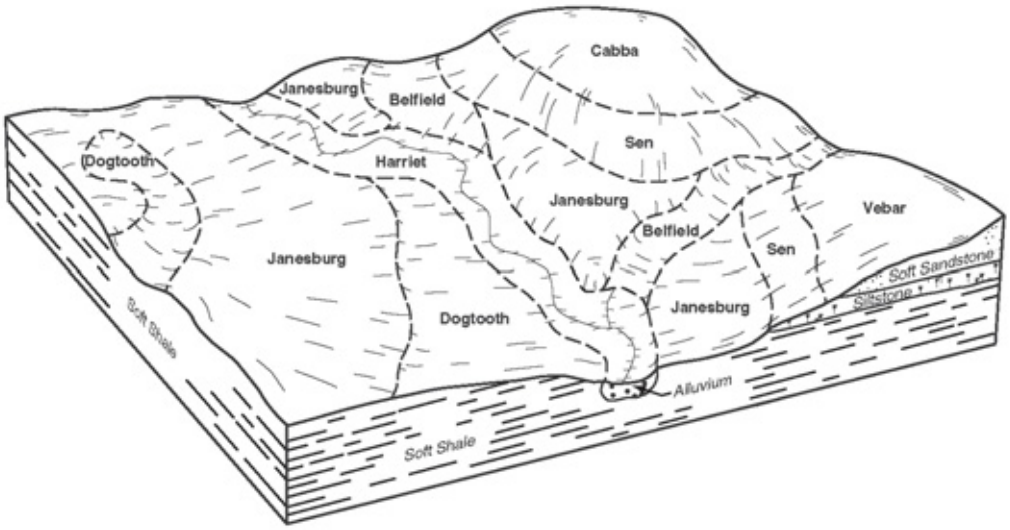


Figure 10. Typical pattern of soils and underlying material in the Janesburg-Dogtooth association.

Detailed Soil Map Units

Map units on the detailed soil maps represent soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the soil maps and interpretive tables, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on the detailed soil maps represents an area on the landscape and consists of one or more soils or miscellaneous areas. The soils or miscellaneous areas are called map unit components. The map unit descriptions in this section describe the setting of the map unit or where on the landscape named map unit components can be found. The composition, or the proportion, of various soils or miscellaneous areas of a map unit determine how a map unit is named.

A map unit is identified according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some included areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called similar soils. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting or dissimilar soils. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. Included soils or miscellaneous areas are mentioned in the map unit descriptions. Soil interpretations in this manuscript are for named map unit components only.

A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

The map unit descriptions on the following pages give a range in composition for the named map unit components and similar soils. They also give the average composition of named, similar, and dissimilar soils.

Soils that have profiles that are almost alike make up a **soil series**. Except for differences in texture of the surface layer or underlying layers, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Golva silt loam, 2 to 6 percent slopes, is one of the phases of the Golva soils.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A **complex** consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Zahl-Williams loams, 6 to 9 percent slopes, is an example.

An **undifferentiated group** is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Glendive and Havre soils, channeled, 0 to 3 percent slopes, is an undifferentiated group in this survey area.

This survey includes **miscellaneous areas**. Such areas have little or no soil material and support little or no vegetation. Pits, gravel and sand, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by special symbols on the soil maps.

The map unit descriptions on the following pages give information on each named component. Information such as surface layer texture, depth class, and drainage class is included. There is also information concerning the management of the map unit.

An identifying symbol precedes the map unit name in each map unit description. This symbol is used to identify delineations on the soil maps.

The “Acreage and Proportionate Extent of the Soils” table gives the acreage and proportionate extent of each map unit in the survey area. Additional information about each named component and map unit inclusion can be found in “Soil Series and Their Morphology.” Hydric soils information can be found in the section “Hydric Soils.” The “Hydric Soils List” table indicates the map unit components with hydric conditions. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas

2—Heil silty clay, 0 to 1 percent slopes

Setting:

Heil soils occur in depressions on uplands.

Map Unit Composition (percent)

Named Components
Heil and similar soils: 45 to 85 percent

Average Component Composition
Heil: 65 percent
Heil, silty clay loam: 23 percent
Grano: 8 percent
Dimmick: 4 percent

Named Component Description

Heil
Slope: 0 to 1 percent
Depth to Restrictive Feature: Natric; top depth ranges from 1 to 4 inches
Drainage Class: Poorly drained
Flooding: None
Water Table: Seasonal
Ponding: Occasional
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 3 inches; silty clay
Btn—3 to 24 inches; silty clay
Bg—24 to 38 inches; silty clay
Byg—38 to 52 inches; silty clay
Cg—52 to 60 inches; silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

3—Dimmick silty clay loam, 0 to 1 percent slopes

Setting:

Dimmick soils occur in depressions on uplands.

Map Unit Composition (percent)

Named Components
Dimmick and similar soils: 45 to 80 percent

Average Component Composition
Dimmick: 61 percent
Parnell: 26 percent
Tonka: 11 percent
Grail: 2 percent

Named Component Description

Dimmick
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Very poorly drained
Flooding: None
Water Table: Seasonal
Ponding: Frequent
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oe—0 to 3 inches; moderately decomposed plant material
A—3 to 6 inches; silty clay loam
Ag—6 to 23 inches; silty clay
Cg—23 to 63 inches; clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Hayland or range and wetland wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

5—Tonka-Hamerly complex, 0 to 3 percent slopes

Setting:

Tonka soils occur in depressions. Hamerly soils are on flats. This map unit occurs on till plains.

Map Unit Composition (percent)

Named Components
Tonka and similar soils: 35 to 70 percent
Hamerly and similar soils: 10 to 40 percent

Average Component Composition
Tonka: 52 percent
Hamerly: 22 percent
Parnell: 6 percent
Heil: 5 percent
Noonan: 4 percent

Divide: 3 percent
Marysland: 3 percent
Niobell: 3 percent
Bowbells: 2 percent

Named Component Description

Tonka
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Poorly drained
Flooding: None
Water Table: Seasonal
Ponding: Frequent
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 13 inches; silt loam
E—13 to 19 inches; loam
Bt—19 to 34 inches; silty clay loam
2BC—34 to 50 inches; clay loam
2Cg—50 to 60 inches; clay loam

Hamerly
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Somewhat poorly drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; loam
Bk—8 to 25 inches; loam
C—25 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

7—Harriet silt loam, 0 to 2 percent slopes

Setting:

Harriet soils occur in drainageways and alluvial flats on uplands. (fig. 11)



Figure 11. An area of Harriet silt loam, 0 to 2 percent slopes. Bare areas, a white saltcrust, and kochia are common in areas of this saline and sodic soil.

Map Unit Composition (percent)

Named Components

Harriet and similar soils: 75 to 90 percent

Average Component Composition

Harriet: 80 percent
Regan: 6 percent
Slickspots: 5 percent
Rhoades: 4 percent
Heil: 3 percent
Daglum: 2 percent

Named Component Description

Harriet

Slope: 0 to 2 percent
Depth to Restrictive Feature: Natric; top depth ranges from 0 to 5 inches
Drainage Class: Poorly drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 18 inches; clay loam
Bz1—18 to 28 inches; loam
2Bz2—28 to 38 inches; very fine sandy loam

3Ab—38 to 40 inches; clay loam
3C—40 to 60 inches; stratified very fine sandy loam to silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

9—Grano silty clay, 0 to 1 percent slopes

Setting:

Grano soils occur in depressions on uplands.

Map Unit Composition (percent)

Named Components
Grano and similar soils: 25 to 75 percent

Average Component Composition
Grano: 50 percent
Heil: 32 percent
Dovray: 18 percent

Named Component Description

Grano
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Very poorly drained
Flooding: None
Water Table: Seasonal
Ponding: Frequent
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oe—0 to 3 inches; moderately decomposed plant material
Ag—3 to 19 inches; silty clay
Cg1—19 to 51 inches; silty clay
2Cg2—51 to 63 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Hayland or range and wetland wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

10—Banks fine sandy loam, slightly wet, 0 to 1 percent slopes

Setting:

Banks soils occur on flats of floodplains in river valleys.

Map Unit Composition (percent)

Named Components

Banks and similar soils: 45 to 85 percent

Average Component Composition

Banks: 62 percent
Banks, silty clay loam: 20 percent
Banks, loamy fine sand: 10 percent
Ridgelawn: 6 percent
Trembles: 2 percent

Named Component Description

Banks

Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 10 inches; fine sandy loam
C—10 to 60 inches; stratified loamy fine sand

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, irrigated cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following

sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

10D—Seroco-Lohler complex, 0 to 15 percent slopes

Setting:

Seroco soils occur on convex dunes. Lohler soils occur on flats of floodplains. This map unit occurs in river valleys.

Map Unit Composition (percent)

Named Components

Seroco and similar soils: 80 to 95 percent
Lohler and similar soils: 5 to 20 percent

Average Component Composition

Seroco: 90 percent
Lohler: 10 percent

Named Component Description

Seroco

Slope: 2 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loamy fine sand
C—3 to 60 inches; fine sand

Lohler

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; silty clay
C—8 to 60 inches; stratified silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, hayland, or range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

11B—Patent loam, 1 to 6 percent slopes

Setting:

Patent soils occur on alluvial fans in badlands.

Map Unit Composition (percent)

Named Components

Patent and similar soils: 70 to 90 percent

Average Component Composition

Patent: 80 percent
Sham: 8 percent
Lonna: 6 percent
Benz: 5 percent
Kremlin: 1 percent

Named Component Description

Patent

Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
AC—0 to 7 inches; loam
C—7 to 60 inches; stratified fine sandy loam to silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

12—Trembles fine sandy loam, 0 to 2 percent slopes

Setting:

Trembles soils occur on linear floodplains in river valleys.

Map Unit Composition (percent)

Named Components

Trembles and similar soils: 55 to 95 percent

Average Component Composition

Trembles: 77 percent
Havrelon: 12 percent
Channel: 5 percent
Banks: 2 percent
Korchea: 2 percent
Rhoades: 2 percent

Named Component Description

Trembles

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 9 inches; fine sandy loam
C—9 to 59 inches; stratified fine sandy loam to silt loam
2C—59 to 80 inches; stratified sand to silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

13—Havrelon silt loam, 0 to 2 percent slopes

Setting:

Havrelon soils occur on linear floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Havrelon and similar soils: 70 to 90 percent

Average Component Composition
Havrelon: 73 percent
Havrelon, fine sandy loam: 7 percent
Channel: 5 percent
Banks: 4 percent
Havrelon, silty clay loam: 4 percent
Ridgelawn: 3 percent
Trembles: 3 percent
Lallie: 1 percent

Named Component Description

Havrelon
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 13 inches; silt loam
C—13 to 60 inches; stratified very fine sandy loam to silty clay loam

Mapunit Notes: This map unit may rarely flood due to protection by dam and dike structures.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

14—Korchea loam, channeled, 0 to 2 percent slopes

Setting:

Korchea soils occur on flats of flood plains in river valleys.

Map Unit Composition (percent)

Named Components
Korchea and similar soils: 30 to 85 percent

Average Component Composition
Korchea: 52 percent
Channel: 40 percent
Velva: 8 percent

Named Component Description

Korchea
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Frequent
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; stratified loam
C—6 to 60 inches; stratified fine sandy loam to silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

15—Korchea loam, 0 to 2 percent slopes

Setting:

Korchea soils occur on flats of floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Korchea and similar soils: 55 to 80 percent

Average Component Composition
Korchea: 71 percent
Shambo: 10 percent
Straw: 7 percent
Channel: 5 percent
Havrelon: 4 percent
Velva: 2 percent
Daglum: 1 percent

Named Component Description

Korchea
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; stratified loam
C—6 to 60 inches; stratified fine sandy loam to silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, hayland, or pasture

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

16—Ridgelawn silt loam, slightly wet, 0 to 2 percent slopes

Setting:

Ridgelawn soils occur on flats of floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Ridgelawn, slightly wet and similar soils: 40 to 75 percent

Average Component Composition
Ridgelawn, slightly wet: 58 percent
Banks, loam: 13 percent
Trembles, slightly wet: 10 percent
Havrelon, slightly wet: 9 percent
Lohler, slightly wet: 7 percent
Hoffmanville, slightly wet: 3 percent

Named Component Description

Ridgelawn
Slope: 0 to 2 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Well drained

Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 9 inches; silt loam
C—9 to 29 inches; stratified loam to silty clay loam
2C—29 to 80 inches; stratified sand to loamy fine sand

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or irrigated cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

17—Lohler silty clay, slightly wet, 0 to 2 percent slopes

Setting:

Lohler soils occur on flats of floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Lohler, slightly wet and similar soils: 80 to 95 percent

Average Component Composition
Lohler, slightly wet: 93 percent
Havrelon, slightly wet: 4 percent
Lallie, drained: 3 percent

Named Component Description

Lohler
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; silty clay
C—8 to 60 inches; stratified silty clay

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or irrigated cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

19—Hoffmanville silty clay, slightly wet, 0 to 2 percent slopes

Setting:

Hoffmanville soils occur on flats of floodplains in river valleys.

Map Unit Composition (percent)

Named Components

Hoffmanville, slightly wet and similar soils: 55 to 85 percent

Average Component Composition

Hoffmanville, slightly wet: 74 percent
Lohler, slightly wet: 10 percent
Scorio, slightly wet: 9 percent
Ridgelawn, slightly wet: 6 percent
Banks, silty clay: 1 percent

Named Component Description

Hoffmanville

Slope: 0 to 2 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:

Ap—0 to 8 inches; silty clay
C1—8 to 26 inches; stratified silty clay loam to silty clay
2C2—26 to 50 inches; stratified loamy fine sand to fine sandy loam
3C3—50 to 61 inches; stratified silty clay loam to silty clay
4C4—61 to 80 inches; stratified fine sandy loam to silt loam

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or irrigated cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

20—Scorio silty clay, slightly wet, 0 to 2 percent slopes

Setting:

Scorio soils occur on flats of floodplains in river valleys.

Map Unit Composition (percent)

Named Components

Scorio, slightly wet and similar soils: 70 to 95 percent

Average Component Composition

Scorio, slightly wet: 76 percent
Scorio silty clay loam, slightly wet: 10 percent
Lohler, slightly wet: 6 percent
Scorio, saline, slightly wet: 5 percent
Havrelon, slightly wet: 3 percent

Named Component Description

Scorio

Slope: 0 to 2 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; silty clay
C1—8 to 32 inches; silty clay
2C2—32 to 60 inches; stratified loam to very fine sand

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or irrigated cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

21B—Tally-Parshall fine sandy loams, 0 to 6 percent slopes

Setting:

The Tally soils occur on footslopes and toeslopes and the Parshall soils occur on toeslopes and in swales on alluvial fans on uplands. The Tally soils occur on risers and the Parshall soils occur on treads on terraces along river valleys.

Map Unit Composition (percent)

Named Components

Tally and similar soils: 40 to 65 percent
Parshall and similar soils: 20 to 40 percent

Average Component Composition

Tally: 50 percent
Parshall: 28 percent
Shambo: 7 percent
Arnegard: 4 percent
Lihen: 4 percent
Krem: 3 percent
Ekalaka: 2 percent
Lefor: 2 percent

Named Component Description

Tally

Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bw—6 to 32 inches; fine sandy loam
Bk—32 to 60 inches; fine sandy loam

Parshall

Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 12 inches; fine sandy loam
Bw—12 to 29 inches; fine sandy loam
Bk—29 to 48 inches; fine sandy loam
BCk—48 to 60 inches; loamy fine sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

21C—Tally-Parshall fine sandy loams, 6 to 9 percent slopes

Setting:

Tally soils occur on convex backslopes. Parshall soils occur on concave footslopes. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Tally and similar soils: 45 to 70 percent
Parshall and similar soils: 15 to 35 percent

Average Component Composition

Tally: 61 percent
Parshall: 19 percent
Parshall, gently sloping: 4 percent
Tally, strongly sloping: 4 percent
Telfer: 4 percent
Vebar: 4 percent
Cohagen: 2 percent
Grail: 1 percent
Manning: 1 percent

Named Component Description

Tally
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bw—6 to 32 inches; fine sandy loam
Bk—32 to 60 inches; fine sandy loam

Parshall
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 12 inches; fine sandy loam
Bw—12 to 29 inches; fine sandy loam
Bk—29 to 48 inches; fine sandy loam
BCk—48 to 60 inches; loamy fine sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

22—Velva fine sandy loam, 0 to 2 percent slopes

Setting:

Velva soils occur on linear flood plains and on treads on stream terraces. This map unit occurs in river valleys.

Map Unit Composition (percent)

Named Components
Velva and similar soils: 70 to 85 percent

Average Component Composition

Velva: 75 percent
Banks: 9 percent
Korchea: 8 percent
Channel: 5 percent
Breien: 2 percent
Minnewaukan: 1 percent

Named Component Description

Velva

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Rare
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
AC—6 to 13 inches; fine sandy loam
C—13 to 60 inches; stratified very fine sandy loam to loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland, or range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

23B—Lihen-Parshall complex, 0 to 6 percent slopes

Setting:

Lihen soils occur on alluvial flats and alluvial fans. Parshall soils occur in swales. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components

Lihen and similar soils: 35 to 50 percent
Parshall and similar soils: 10 to 20 percent

Average Component Composition

Lihen: 38 percent
Parshall: 15 percent
Telfer: 15 percent
Tally: 9 percent

Stady: 7 percent
Lihen, fine sandy loam: 6 percent
Seroco: 3 percent
Shambo: 3 percent
Beisigl: 2 percent
Manning: 2 percent

Named Component Description

Lihen

Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A1—0 to 9 inches; loamy fine sand
A2—9 to 24 inches; loamy sand
Bk—24 to 32 inches; sand
C—32 to 60 inches; sand

Parshall

Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 12 inches; fine sandy loam
Bw—12 to 29 inches; fine sandy loam
Bk—29 to 48 inches; fine sandy loam
BCk—48 to 60 inches; loamy fine sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

23D—Beisigl-Telfer loamy fine sands, 6 to 15 percent slopes

Setting:

Beisigl soils occur on convex backslopes. Telfer soils occur on concave footslopes. This map unit occurs on hills and ridges on uplands.

Map Unit Composition (percent)

Named Components

Beisigl and similar soils: 25 to 60 percent
Telfer and similar soils: 20 to 55 percent

Average Component Composition

Beisigl: 41 percent
Telfer: 31 percent
Tally: 15 percent
Flasher: 7 percent
Vebar: 5 percent
Lakota: 1 percent

Named Component Description

Beisigl

Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loamy fine sand
Bk—5 to 27 inches; loamy fine sand
Cr—27 to 60 inches; bedrock

Telfer

Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loamy fine sand
C—6 to 60 inches; fine sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Hayland, pasture, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

24—Arnegard loam, 0 to 2 percent slopes

Setting:

Arnegard soils occur on alluvial flats and in swales on uplands.

Map Unit Composition (percent)

Named Components

Arnegard and similar soils: 55 to 70 percent

Average Component Composition

Arnegard: 68 percent
Farnuf: 10 percent
Parshall: 7 percent
Belfield: 4 percent
Grail: 4 percent
Stady: 3 percent
Amor: 2 percent
Savage: 2 percent

Named Component Description

Arnegard

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 13 inches; loam
Bw—13 to 36 inches; loam
Bk—36 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

25—Farnuf loam, 0 to 2 percent slopes

Setting:

Farnuf soils occur on flats on terraces and uplands.

Map Unit Composition (percent)

Named Components

Farnuf and similar soils: 45 to 60 percent

Average Component Composition

Farnuf: 50 percent
Arnegard: 16 percent
Farland: 10 percent
Parshall: 6 percent
Shambo: 5 percent
Belfield: 4 percent
Bowdle: 3 percent
Felor: 2 percent
Lehr: 2 percent
Reeder: 2 percent

Named Component Description

Farnuf

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 9 inches; loam
Bt—9 to 23 inches; clay loam
Bk—23 to 34 inches; loam
C—34 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

25B—Farnuf loam, 2 to 6 percent slopes

Setting:

Farnuf soils occur on terraces and linear alluvial fans on uplands.

Map Unit Composition (percent)

Named Components

Farnuf and similar soils: 45 to 65 percent

Average Component Composition

Farnuf: 58 percent
Shambo: 17 percent
Arnegard: 11 percent
Belfield: 4 percent
Reeder: 4 percent
Parshall: 3 percent
Stady: 2 percent
Maschetah: 1 percent

Named Component Description

Farnuf

Slope: 2 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 9 inches; loam
Bt—9 to 23 inches; clay loam
Bk—23 to 34 inches; loam
C—34 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

25C—Farnuf loam, 6 to 9 percent slopes

Setting:

Farnuf soils occur on linear alluvial fans and footslopes of ridges on uplands.

Map Unit Composition (percent)

Named Components

Farnuf and similar soils: 40 to 80 percent

Average Component Composition

Farnuf: 67 percent
Shambo: 12 percent
Arnegard: 5 percent
Belfield: 5 percent
Cherry: 5 percent
Savage: 3 percent
Tally: 3 percent

Named Component Description

Farnuf

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 9 inches; loam
Bt—9 to 23 inches; clay loam
Bk—23 to 34 inches; loam
C—34 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland.

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

26—Tansem-Roseglen silt loams, 0 to 3 percent slopes

Setting:

Tansem soils occur on rises. Roseglen soils occur in swales. This map unit occurs on glacial lake plains on uplands.

Map Unit Composition (percent)

Named Components

Tansem and similar soils: 45 to 80 percent
Roseglen and similar soils: 15 to 45 percent

Average Component Composition

Tansem: 64 percent
Roseglen: 20 percent
Makoti: 7 percent
Williams: 5 percent
Tally: 3 percent
Stady: 1 percent

Named Component Description

Tansem

Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bw—6 to 14 inches; silt loam
Bk—14 to 28 inches; silt loam
C—28 to 60 inches; silt loam

Roseglen

Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silt loam
Bw—7 to 24 inches; silt loam
Bk—24 to 34 inches; silt loam
C—34 to 60 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following

sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

26B—Tansem-Roseglen silt loams, 3 to 6 percent slopes

Setting:

Tansem soils occur on rises. Roseglen soils occur in swales. This map unit occurs on glacial lake plains on uplands.

Map Unit Composition (percent)

Named Components

Tansem and similar soils: 50 to 85 percent
Roseglen and similar soils: 5 to 25 percent

Average Component Composition

Tansem: 74 percent
Roseglen: 15 percent
Cabba: 4 percent
Sakakawea: 3 percent
Lihen: 2 percent
Parshall: 2 percent

Named Component Description

Tansem

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bw—6 to 14 inches; silt loam
Bk—14 to 28 inches; silt loam
C—28 to 60 inches; silt loam

Roseglen

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silt loam
Bw—7 to 24 inches; silt loam
Bk—24 to 34 inches; silt loam
C—34 to 60 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

27—Golva silt loam, 0 to 2 percent slopes

Setting:

Golva soils occur on alluvial flats on uplands.

Map Unit Composition (percent)

Named Components

Golva and similar soils: 50 to 90 percent

Average Component Composition

Golva: 67 percent
Golva, silty clay loam: 17 percent
Farland: 8 percent
Velva: 4 percent
Korchea: 2 percent
Lehr: 2 percent

Named Component Description

Golva

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; silt loam
Bw1—5 to 15 inches; silt loam
Bw2—15 to 21 inches; silt loam
Bk—21 to 40 inches; silt loam
C—40 to 60 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

27B—Golva silt loam, 2 to 6 percent slopes

Setting:

Golva soils occur on alluvial fans on uplands.

Map Unit Composition (percent)

Named Components

Golva and similar soils: 45 to 85 percent

Average Component Composition

Golva: 62 percent
Grassna: 14 percent
Sen: 7 percent
Belfield: 5 percent
Maschetah: 5 percent
Savage: 4 percent
Lawther: 3 percent

Named Component Description

Golva

Slope: 2 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; silt loam
Bw1—5 to 15 inches; silt loam
Bw2—15 to 21 inches; silt loam
Bk—21 to 40 inches; silt loam
C—40 to 60 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

27C—Golva silt loam, 6 to 9 percent slopes

Setting:

Golva soils occur on alluvial fans and footslopes of ridges on uplands.

Map Unit Composition (percent)

Named Components

Golva and similar soils: 45 to 80 percent

Average Component Composition

Golva: 67 percent
Golva, strongly sloping: 14 percent
Cherry: 4 percent
Grassna: 4 percent
Sen: 4 percent
Janesburg: 3 percent
Chama: 2 percent
Tally: 2 percent

Named Component Description

Golva

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; silt loam
Bw1—5 to 15 inches; silt loam
Bw2—15 to 21 inches; silt loam
Bk—21 to 40 inches; silt loam
C—40 to 60 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following

sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

29—Savage silty clay loam, 0 to 2 percent slopes

Setting:

Savage soils occur on alluvial flats on uplands.

Map Unit Composition (percent)

Named Components

Savage and similar soils: 55 to 70 percent

Average Component Composition

Savage: 61 percent
Grail: 17 percent
Belfield: 8 percent
Farnuf: 5 percent
Regent: 3 percent
Daglum: 2 percent
Lawther: 2 percent
Parshall: 2 percent

Named Component Description

Savage

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silty clay loam
Bt—7 to 25 inches; silty clay
Bk—25 to 51 inches; silty clay loam
C—51 to 80 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

29B—Savage silty clay loam, 2 to 6 percent slopes

Setting:

Savage soils occur on alluvial fans on uplands.

Map Unit Composition (percent)

Named Components

Savage and similar soils: 55 to 70 percent

Average Component Composition

Savage: 67 percent
Grail: 11 percent
Farland: 7 percent
Regent: 4 percent
Shambo: 4 percent
Daglum: 3 percent
Amor: 2 percent
Stady: 2 percent

Named Component Description

Savage

Slope: 2 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silty clay loam
Bt—7 to 25 inches; silty clay
Bk—25 to 51 inches; silty clay loam
C—51 to 80 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

29C—Savage silty clay loam, 6 to 9 percent slopes

Setting:

Savage soils occur on concave linear footslopes along ridges on uplands.

Map Unit Composition (percent)

Named Components

Savage and similar soils: 45 to 75 percent

Average Component Composition

Savage: 58 percent
Savage, gently sloping: 8 percent
Farnuf: 7 percent
Daglum: 6 percent
Regent: 6 percent
Farland: 5 percent
Reeder: 5 percent
Grail: 3 percent
Maschetah: 2 percent

Named Component Description

Savage

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silty clay loam
Bt—7 to 25 inches; silty clay
Bk—25 to 51 inches; silty clay loam
C—51 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

30—Lawther silty clay, 0 to 2 percent slopes

Setting:

Lawther soils occur on alluvial flats and terraces on uplands.

Map Unit Composition (percent)

Named Components
Lawther and similar soils: 65 to 80 percent

Average Component Composition
Lawther: 77 percent
Savage: 11 percent
Belfield: 4 percent
Moreau: 4 percent
Daglum: 3 percent
Cabba: 1 percent

Named Component Description

Lawther
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 10 inches; silty clay
Bss—10 to 33 inches; silty clay
Bk—33 to 47 inches; silty clay
C—47 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

31B—Cherry silt loam, 0 to 6 percent slopes

Setting:

Cherry soils occur on alluvial fans on uplands.

Map Unit Composition (percent)

Named Components
Cherry and similar soils: 60 to 90 percent

Average Component Composition
Cherry: 76 percent
Maschetah: 18 percent
Golva: 4 percent
Havrelon: 2 percent

Named Component Description

Cherry
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bw—3 to 33 inches; silt loam
C—33 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

31C—Cherry silt loam, 6 to 9 percent slopes

Setting:

Cherry soils occur on alluvial fans on uplands.

Map Unit Composition (percent)

Named Components
Cherry and similar soils: 60 to 90 percent

Average Component Composition
Cherry: 68 percent
Lambert: 12 percent
Maschetah: 11 percent

Farnuf: 6 percent
Daglum: 2 percent
Cabba: 1 percent

Named Component Description

Cherry
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bw—3 to 33 inches; silt loam
C—33 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

32F—Cherry-Cabba silt loams, 9 to 40 percent slopes

Setting:

Cherry soils occur on backslopes and footslopes of fans. Cabba soils occur on summits and shoulders of ridges. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components
Cherry and similar soils: 15 to 35 percent
Cabba and similar soils: 25 to 40 percent

Average Component Composition
Cherry: 20 percent
Cherry, strongly sloping: 15 percent
Cabba: 29 percent
Chama: 8 percent
Maschetah: 7 percent
Farnuf: 6 percent
Lambert: 5 percent

Janesburg: 4 percent
Amor: 3 percent
Badland, outcrop: 3 percent

Named Component Description

Cherry
Slope: 15 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bw—3 to 33 inches; silt loam
C—33 to 60 inches; silty clay loam

Cabba
Slope: 15 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

33—Belfield-Grail silty clay loams, 0 to 2 percent slopes

Setting:

Belfield soils occur on alluvial flats. Grail soils occur on swales. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components

Belfield and similar soils: 45 to 60 percent
Grail and similar soils: 20 to 35 percent

Average Component Composition

Belfield: 49 percent
Grail: 26 percent
Savage: 7 percent
Daglum: 6 percent
Farnuf: 4 percent
Arnegard: 2 percent
Lawther: 2 percent
Regent: 2 percent
Straw: 2 percent

Named Component Description

Belfield

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 9 inches; silty clay loam
E/B—9 to 12 inches; silty clay loam
Btn1—12 to 17 inches; silty clay
Btn2—17 to 24 inches; silty clay loam
Bk—24 to 43 inches; silty clay loam
C—43 to 60 inches; clay loam

Grail

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 10 inches; silty clay loam
Bt—10 to 24 inches; silty clay
Bk—24 to 52 inches; silty clay loam
C—52 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.



Figure 12. Windbreaks and stripcropping on an area of Belfield-Grail silty clay loams, 0 to 2 percent slopes.

Management

Major uses: Cropland (fig. 12)

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

33B—Belfield-Savage silty clay loams, 2 to 6 percent slopes

Setting:

Belfield soils occur on concave linear positions and Savage soils occur on convex linear positions. Belfield soils are in micro-lows. These soils are on alluvial fans on uplands.

Map Unit Composition (percent)

Named Components

Belfield and similar soils: 25 to 55 percent
Savage and similar soils: 20 to 50 percent

Average Component Composition

Belfield: 42 percent
Savage: 34 percent
Daglum: 7 percent

Farnuf: 7 percent
Grail: 6 percent
Golva: 4 percent

Named Component Description

Belfield
Slope: 2 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 9 inches; silty clay loam
E/B—9 to 12 inches; silty clay loam
Btn1—12 to 17 inches; silty clay
Btn2—17 to 24 inches; silty clay loam
Bk—24 to 43 inches; silty clay loam
C—43 to 60 inches; clay loam

Savage
Slope: 2 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silty clay loam
Bt—7 to 25 inches; silty clay
Bk—25 to 51 inches; silty clay loam
C—51 to 80 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

34B—Daglum-Belfield complex, 0 to 6 percent slopes

Setting:

Daglum soils occur in micro-lows. Belfield soils occur on micro-highs. This map unit occurs on alluvial fans on uplands.

Map Unit Composition (percent)

Named Components

Daglum and similar soils: 35 to 60 percent
Belfield and similar soils: 10 to 30 percent

Average Component Composition

Daglum: 52 percent
Belfield: 17 percent
Rhoades: 10 percent
Farnuf: 9 percent
Savage: 6 percent
Lawther: 4 percent
Reeder: 1 percent
Vebar: 1 percent

Named Component Description

Daglum

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 4 to 20 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
Ap—0 to 7 inches; loam
E—7 to 8 inches; silt loam
Btn—8 to 18 inches; clay
Bky—18 to 32 inches; clay loam
BCk—32 to 47 inches; clay loam
C—47 to 60 inches; clay loam

Belfield

Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 9 inches; silt loam
E/B—9 to 12 inches; silty clay loam

Btn1—12 to 17 inches; silty clay
Btn2—17 to 24 inches; silty clay loam
Bk—24 to 43 inches; silty clay loam
C—43 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

36B—Rhoades-Daglum complex, 0 to 6 percent slopes

Setting:

Rhoades soils occur in micro-lows. Daglum soils occur on micro-highs. This map unit occurs on alluvial flats and fans on uplands.

Map Unit Composition (percent)

Named Components
Rhoades and similar soils: 45 to 65 percent
Daglum and similar soils: 25 to 40 percent

Average Component Composition
Rhoades: 55 percent
Daglum: 33 percent
Belfield: 5 percent
Savage: 3 percent
Moreau: 2 percent
Slickspots: 2 percent

Named Component Description

Rhoades
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 1 to 5 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 3 inches; silt loam
Btn—3 to 8 inches; silty clay
Btknyz—8 to 14 inches; silty clay
Bky—14 to 46 inches; silty clay
C—46 to 60 inches; stratified silt loam to silty clay loam

Daglum

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 4 to 20 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
Ap—0 to 7 inches; loam
E—7 to 8 inches; silt loam
Btn—8 to 18 inches; clay
Bky—18 to 32 inches; clay loam
BCk—32 to 47 inches; clay loam
C—47 to 60 inches; clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

38B—Dogtooth-Janesburg silt loams, 0 to 6 percent slopes

Setting:

Dogtooth soils occur in micro-lows. Janesburg soils occur on micro-highs. This map unit occurs on pediments on uplands.

Map Unit Composition (percent)

Named Components

Dogtooth and similar soils: 50 to 65 percent
Janesburg and similar soils: 25 to 40 percent

Average Component Composition

Dogtooth: 59 percent
Janesburg: 27 percent
Daglum: 5 percent
Regent: 2 percent
Savage: 2 percent
Slickspots: 2 percent
Wayden: 2 percent
Chama: 1 percent

Named Component Description

Dogtooth

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 8 inches; silty clay
Btkn—8 to 13 inches; silty clay
Bky—13 to 21 inches; silty clay
Cr—21 to 60 inches; bedrock

Janesburg

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; silt loam
E—8 to 10 inches; silt loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

38F—Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes

Setting:

Dogtooth soils occur in micro-lows on backslopes. Janesburg soils occur on micro-highs on backslopes. Cabba soils occur on shoulders. This map unit occurs on hills and ridges on uplands.

Map Unit Composition (percent)

Named Components

Dogtooth and similar soils: 25 to 40 percent
Janesburg and similar soils: 15 to 25 percent
Cabba and similar soils: 10 to 25 percent

Average Component Composition

Dogtooth: 33 percent
Janesburg: 22 percent
Cabba: 20 percent
Moreau: 7 percent
Wayden: 4 percent
Amor: 3 percent
Chama: 3 percent
Ekalaka: 3 percent
Regan: 3 percent
Slickspots: 2 percent

Named Component Description

Dogtooth

Slope: 6 to 25 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 8 inches; silty clay
Btkn—8 to 13 inches; silty clay
Bky—13 to 21 inches; silty clay
Cr—21 to 60 inches; bedrock

Janesburg

Slope: 6 to 25 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None

Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; silt loam
E—8 to 10 inches; silt loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Cabba
Slope: 9 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

40B—Desart-Janesburg-Ekalaka complex, 0 to 6 percent slopes

Setting:

Desart soils occur on convex linear toeslopes. Janesburg soils occur on convex rises. Ekalaka soils occur on concave linear toeslopes. This map unit occurs on alluvial fans on uplands.

Map Unit Composition (percent)

Named Components
Desart and similar soils: 10 to 45 percent
Ekalaka and similar soils: 10 to 45 percent
Janesburg and similar soils: 5 to 25 percent

Average Component Composition

Desart: 24 percent
Ekalaka: 22 percent
Janesburg: 16 percent
Tally: 10 percent
Daglum: 9 percent
Savage: 8 percent
Belfield: 6 percent
Dogtooth: 3 percent
Shambo: 3 percent
Heil: 2 percent

Named Component Description

Desart

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 15 to 30 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 20 inches; fine sandy loam
E—20 to 24 inches; loamy fine sand
Btn—24 to 31 inches; fine sandy loam
C—31 to 60 inches; loamy fine sand

Janesburg

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches
Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; loam
E—8 to 10 inches; loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Ekalaka

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 5 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches

Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 6 inches; fine sandy loam
E—6 to 12 inches; fine sandy loam
Btn—12 to 17 inches; fine sandy loam
Bz—17 to 33 inches; fine sandy loam
C—33 to 60 inches; stratified fine sandy loam to loamy sand to sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

41—Williams-Bowbells loams, 0 to 3 percent slopes

Setting:

Williams soils occur on rises. Bowbells soils occur in swales. This map unit occurs on till plains.

Map Unit Composition (percent)

Named Components
Williams and similar soils: 40 to 65 percent
Bowbells and similar soils: 30 to 55 percent
Average Component Composition
Williams: 47 percent
Bowbells: 37 percent
Max: 6 percent
Temvik: 5 percent
Tonka: 2 percent
Heil: 1 percent
Manning: 1 percent
Reeder: 1 percent

Named Component Description

Williams
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Bowbells
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loam
Bt1—6 to 14 inches; clay loam
Bt2—14 to 23 inches; clay loam
Bk—23 to 36 inches; loam
C—36 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

41B—Williams-Bowbells loams, 3 to 6 percent slopes

Setting:

Williams soils occur on rises. Bowbells soils occur in swales. This map unit occurs on till plains.

Map Unit Composition (percent)

Named Components
Williams and similar soils: 50 to 70 percent
Bowbells and similar soils: 20 to 40 percent

Average Component Composition
Williams: 60 percent
Bowbells: 27 percent
Max: 5 percent
Zahl: 5 percent

Reeder: 1 percent
Tonka: 1 percent
Vebar: 1 percent

Named Component Description

Williams
Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Bowbells
Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loam
Bt1—6 to 14 inches; clay loam
Bt2—14 to 23 inches; clay loam
Bk—23 to 36 inches; loam
C—36 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

42B—Williams-Zahl loams, 3 to 6 percent slopes

Setting:

Williams soils occur on summits and backslopes of ridges and knolls. Zahl soils occur on shoulders of ridges and knolls. This map unit occurs on till plains.

Map Unit Composition (percent)

Named Components

Williams and similar soils: 35 to 60 percent
Zahl and similar soils: 15 to 35 percent

Average Component Composition

Williams: 49 percent
Zahl: 27 percent
Bowbells: 8 percent
Max: 8 percent
Dooley: 3 percent
Niobell: 2 percent
Amor: 1 percent
Chama: 1 percent
Tonka: 1 percent

Named Component Description

Williams

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Zahl

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

42C—Williams loam, 6 to 9 percent slopes

Setting:

Williams soils occur on summits and backslopes of ridges on till plains.

Map Unit Composition (percent)

Named Components
Williams and similar soils: 40 to 80 percent

Average Component Composition
Williams: 58 percent
Williams, undulating: 17 percent
Bowbells: 8 percent
Niobell: 8 percent
Zahl: 5 percent
Moreau: 2 percent
Noonan: 2 percent

Named Component Description

Williams
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

43C—Williams-Zahl loams, 6 to 9 percent slopes

Setting:

Williams soils occur on summits and backslopes. Zahl soils occur on shoulders. This map unit occurs on ridges on till plains.

Map Unit Composition (percent)

Named Components

Williams and similar soils: 25 to 45 percent
Zahl and similar soils: 30 to 50 percent

Average Component Composition

Williams: 35 percent
Zahl: 35 percent
Bowbells: 10 percent
Cabba: 5 percent
Amor: 4 percent
Max: 4 percent
Williams, undulating: 4 percent
Zahl, rolling: 2 percent
Noonan: 1 percent

Named Component Description

Williams

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Zahl

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

44D—Zahl-Williams loams, 9 to 15 percent slopes

Setting:

Zahl soils occur on summits and shoulders. Williams soils occur on backslopes and footslopes. This map unit occurs on ridges on till plains.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 40 to 60 percent
Williams and similar soils: 15 to 35 percent

Average Component Composition

Zahl: 45 percent
Williams: 21 percent
Max: 15 percent
Bowbells: 10 percent
Reeder: 3 percent
Cabba: 2 percent
Chama: 2 percent
Wabek: 2 percent

Named Component Description

Zahl

Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted

Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Williams
Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, hayland, or range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

44E—Zahl-Williams loams, 15 to 25 percent slopes

Setting:

Zahl soils occur on shoulders of knolls and ridges. Williams soils occur on backslopes and summits of knolls and ridges. This map unit occurs on till plains.

Map Unit Composition (percent)

Named Components
Zahl and similar soils: 35 to 65 percent
Williams and similar soils: 15 to 45 percent

Average Component Composition

Zahl: 46 percent
Williams: 30 percent
Bowbells: 11 percent
Reeder: 6 percent
Tally: 4 percent
Cohagen: 3 percent

Named Component Description

Zahl

Slope: 15 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Williams

Slope: 15 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

45F—Zahl-Cabba-Maschetah complex, 3 to 70 percent slopes

Setting:

Zahl soils occur on summits. Cabba soils occur on shoulders. Maschetah soils occur on linear footslopes. This map unit occurs on ridges on till mantled residual uplands.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 15 to 35 percent
Cabba and similar soils: 15 to 30 percent
Maschetah and similar soils: 10 to 30 percent

Average Component Composition

Zahl: 23 percent
Cabba: 21 percent
Maschetah: 17 percent
Williams: 12 percent
Chama: 10 percent
Straw: 6 percent
Amor: 3 percent
Dogtooth: 2 percent
Dooley: 2 percent
Savage: 2 percent
Wabek: 2 percent

Named Component Description

Zahl

Slope: 9 to 60 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Cabba

Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Maschetah
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 7 inches; silt loam
Bk—7 to 48 inches; silt loam
C—48 to 90 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

46B—Dooley-Zahl complex, 3 to 6 percent slopes

Setting:

Dooley soils occur on backslopes. Zahl soils occur on shoulders. This map unit occurs on ridges and knolls on sand mantled till plains.

Map Unit Composition (percent)

Named Components
Dooley and similar soils: 35 to 60 percent
Zahl and similar soils: 5 to 25 percent

Average Component Composition
Dooley: 41 percent
Livona: 18 percent
Tally: 14 percent
Zahl: 12 percent
Williams: 6 percent
Bowbells: 3 percent
Flasher: 2 percent

Manning: 2 percent
Noonan: 2 percent

Named Component Description

Dooley
Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bt—6 to 15 inches; sandy clay loam
Bk—15 to 24 inches; sandy loam
2C—24 to 60 inches; clay loam

Zahl
Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

46C—Dooley-Zahl complex, 6 to 9 percent slopes

Setting:

Dooley soils occur on backslopes. Zahl soils occur on shoulders. This map unit occurs on ridges and knolls on sand mantled till plains.

Map Unit Composition (percent)

Named Components

Dooley and similar soils: 25 to 65 percent
Zahl and similar soils: 10 to 35 percent

Average Component Composition

Dooley: 45 percent
Zahl: 22 percent
Livona: 10 percent
Williams: 9 percent
Tally: 8 percent
Vebar: 3 percent
Beisigl: 2 percent
Telfer: 1 percent

Named Component Description

Dooley

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bt—6 to 15 inches; sandy clay loam
Bk—15 to 24 inches; sandy loam
2C—24 to 60 inches; clay loam

Zahl

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

46D—Dooley-Zahl complex, 9 to 15 percent slopes

Setting:

Dooley soils occur on backslopes. Zahl soils occur on shoulders. This map unit occurs on ridges and knolls on till plains.

Map Unit Composition (percent)

Named Components

Dooley and similar soils: 20 to 55 percent
Zahl and similar soils: 15 to 45 percent

Average Component Composition

Dooley: 31 percent
Zahl: 25 percent
Livona: 12 percent
Williams: 11 percent
Tally: 9 percent
Dooley, moderately sloping: 3 percent
Flasher: 3 percent
Niobell: 3 percent
Vebar: 3 percent

Named Component Description

Dooley

Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bt—6 to 15 inches; sandy clay loam
Bk—15 to 24 inches; sandy loam
2C—24 to 60 inches; clay loam

Zahl

Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected

Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

48—Temvik-Wilton silt loams, 0 to 3 percent slopes

Setting:

Temvik soils occur on slight rises. Wilton soils occur on flats and in swales. This map unit occurs on silty loess-mantled till plains.

Map Unit Composition (percent)

Named Components
Temvik and similar soils: 45 to 65 percent
Wilton and similar soils: 25 to 45 percent

Average Component Composition
Temvik: 51 percent
Wilton: 38 percent
Williams: 9 percent
Grassna: 2 percent

Named Component Description

Temvik
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silt loam
Bw—7 to 24 inches; silt loam
2Bk—24 to 44 inches; clay loam
2C—44 to 60 inches; clay loam

Wilton
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; silt loam
Bw—8 to 27 inches; silt loam
2Bk—27 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

49—Temvik-Williams silt loams, 0 to 3 percent slopes

Setting:

Temvik soils occur on flats. Williams soils occur on footslopes of rises. This map unit occurs on silty loess-mantled till plains.

Map Unit Composition (percent)

Named Components
Temvik and similar soils: 30 to 65 percent
Williams and similar soils: 25 to 55 percent

Average Component Composition
Temvik: 47 percent
Williams: 38 percent
Wilton: 7 percent
Max: 6 percent
Grassna: 2 percent

Named Component Description

Temvik
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None

Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silt loam
Bw—7 to 24 inches; silt loam
2Bk—24 to 44 inches; clay loam
2C—44 to 60 inches; clay loam

Williams
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

49B—Temvik-Williams silt loams, 3 to 6 percent slopes

Setting:

Temvik soils occur on flats. Williams soils occur on footslopes of rises. This map unit occurs on silty loess-mantled till plains.

Map Unit Composition (percent)

Named Components
Temvik and similar soils: 40 to 60 percent
Williams and similar soils: 10 to 25 percent

Average Component Composition
Temvik: 50 percent
Wilton: 21 percent

Williams: 16 percent
Max: 5 percent
Bryant: 3 percent
Zahl: 3 percent
Flaxton: 2 percent

Named Component Description

Temvik

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silt loam
Bw—7 to 24 inches; silt loam
2Bk—24 to 44 inches; clay loam
2C—44 to 60 inches; clay loam

Williams

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

50B—Temvik-Zahl complex, 3 to 6 percent slopes

Setting:

Temvik soils occur on flats. Zahl soils occur on shoulders of rises. This map unit occurs on silty loess-mantled till plains.

Map Unit Composition (percent)

Named Components

Temvik and similar soils: 30 to 65 percent
Zahl and similar soils: 15 to 45 percent

Average Component Composition

Temvik: 48 percent
Zahl: 26 percent
Williams: 14 percent
Max: 8 percent
Grassna: 4 percent

Named Component Description

Temvik

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silt loam
Bw—7 to 24 inches; silt loam
2Bk—24 to 44 inches; clay loam
2C—44 to 60 inches; clay loam

Zahl

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

51B—Amor-Shambo loams, 3 to 6 percent slopes

Setting:

Amor soils occur on pediments. Shambo soils occur on alluvial fans. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components

Amor and similar soils: 65 to 80 percent
Shambo and similar soils: 10 to 20 percent

Average Component Composition

Amor: 67 percent
Shambo: 15 percent
Morton: 7 percent
Chama: 4 percent
Cabba: 3 percent
Arnegard: 2 percent
Vebar: 2 percent

Named Component Description

Amor

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; loam
Bw—8 to 19 inches; loam
Bk—19 to 31 inches; loam
Cr—31 to 60 inches; bedrock

Shambo

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None

Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 9 inches; loam
Bw1—9 to 13 inches; loam
Bw2—13 to 29 inches; loam
Bk—29 to 48 inches; loam
C—48 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

51C—Amor-Cabba loams, 6 to 9 percent slopes

Setting:

Amor soils occur on backslopes. Cabba soils occur on shoulders. This map unit occurs on knolls and ridges on uplands.

Map Unit Composition (percent)

Named Components
Amor and similar soils: 30 to 45 percent
Cabba and similar soils: 25 to 35 percent

Average Component Composition
Amor: 39 percent
Cabba: 29 percent
Amor, gently sloping: 10 percent
Shambo: 9 percent
Chama: 5 percent
Cohagen: 3 percent
Regent: 3 percent
Savage: 2 percent

Named Component Description

Amor
Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None

Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; loam
Bw—8 to 19 inches; loam
Bk—19 to 31 inches; loam
Cr—31 to 60 inches; bedrock

Cabba
Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture and hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

51D—Amor-Cabba loams, 9 to 15 percent slopes

Setting:

Amor soils occur on backslopes. Cabba soils occur on shoulders. This map unit occurs on hills and ridges on uplands.

Map Unit Composition (percent)

Named Components
Amor and similar soils: 35 to 45 percent
Cabba and similar soils: 20 to 30 percent

Average Component Composition
Amor: 42 percent
Cabba: 29 percent

Amor, moderately sloping: 5 percent
Shambo: 5 percent
Chama: 4 percent
Cohagen: 4 percent
Vebar: 3 percent
Arnegard: 2 percent
Dogtooth: 2 percent
Regent: 2 percent
Savage: 2 percent

Named Component Description

Amor
Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; loam
Bw—8 to 19 inches; loam
Bk—19 to 31 inches; loam
Cr—31 to 60 inches; bedrock

Cabba
Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

52B—Reeder-Farnuf loams, 3 to 6 percent slopes

Setting:

Reeder soils occur on convex linear backslopes. Farnuf soils occur on linear footslopes. This map unit occurs on rises on uplands.

Map Unit Composition (percent)

Named Components

Reeder and similar soils: 35 to 55 percent
Farnuf and similar soils: 10 to 25 percent

Average Component Composition

Reeder: 49 percent
Farnuf: 16 percent
Amor: 14 percent
Arnegard: 5 percent
Daglum: 4 percent
Regent: 4 percent
Savage: 4 percent
Cabba: 2 percent
Vebar: 2 percent

Named Component Description

Reeder

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; loam
Bt—8 to 17 inches; clay loam
Bk—17 to 36 inches; loam
Cr—36 to 60 inches; bedrock

Farnuf

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 9 inches; loam
Bt—9 to 23 inches; clay loam
Bk—23 to 34 inches; loam
C—34 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

52C—Reeder-Cabba loams, 6 to 9 percent slopes

Setting:

Reeder soils are on convex backslopes. Cabba soils are on shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Reeder and similar soils: 25 to 70 percent
Cabba and similar soils: 5 to 45 percent

Average Component Composition

Reeder: 34 percent
Cabba: 16 percent
Regent: 12 percent
Reeder, gently sloping: 10 percent
Regent, gently sloping: 10 percent
Farland: 9 percent
Williams: 5 percent
Chama: 2 percent
Lefor: 2 percent

Named Component Description

Reeder

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; loam
Bt—8 to 17 inches; clay loam

Bk—17 to 36 inches; loam
Cr—36 to 60 inches; bedrock

Cabba
Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

53B—Chama-Sen-Cabba silt loams, 3 to 6 percent slopes

Setting:

Chama and Sen soils occur on pediments. Cabba soils occur on rises on pediments. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components
Chama and similar soils: 35 to 50 percent
Sen and similar soils: 20 to 30 percent
Cabba and similar soils: 10 to 20 percent

Average Component Composition
Chama: 43 percent
Sen: 25 percent
Cabba: 14 percent
Golva: 12 percent
Chama, moderately sloping: 2 percent
Janesburg: 2 percent
Maschetah: 2 percent

Named Component Description

Chama

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; silt loam
Bw—4 to 8 inches; silt loam
Bk—8 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Sen

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bw—6 to 17 inches; silt loam
Bk—17 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Cabba

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

53C—Chama-Cabba-Sen silt loams, 6 to 9 percent slopes

Setting:

Chama and Sen soils occur on backslopes. Cabba soils occur on shoulders. This map unit occurs on knolls and hills on uplands.

Map Unit Composition (percent)

Named Components

Chama and similar soils: 35 to 45 percent
Cabba and similar soils: 20 to 30 percent
Sen and similar soils: 10 to 20 percent

Average Component Composition

Chama: 40 percent
Cabba: 28 percent
Sen: 17 percent
Cohagen: 4 percent
Chama, gently sloping: 3 percent
Golva: 3 percent
Grail: 3 percent
Janesburg: 1 percent
Vebar: 1 percent

Named Component Description

Chama

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; silt loam
Bw—4 to 8 inches; silt loam
Bk—8 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Cabba

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Sen

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bw—6 to 17 inches; silt loam
Bk—17 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

53D—Cabba-Chama-Sen silt loams, 9 to 15 percent slopes

Setting:

Cabba soils occur on shoulders. Chama and Sen soils occur on backslopes. This map unit occurs on hills and ridges on uplands.

Map Unit Composition (percent)

Named Components

Cabba and similar soils: 30 to 45 percent
Chama and similar soils: 20 to 35 percent
Sen and similar soils: 10 to 20 percent

Average Component Composition

Cabba: 38 percent
Chama: 26 percent
Sen: 16 percent
Vebar: 5 percent
Arnegard: 4 percent
Cabba, gently sloping: 4 percent
Janesburg: 3 percent
Golva: 2 percent
Maschetah: 2 percent

Named Component Description

Cabba

Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Chama

Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; silt loam
Bw—4 to 8 inches; silt loam
Bk—8 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Sen

Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches

Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bw—6 to 17 inches; silt loam
Bk—17 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

54F—Cabba-Sen-Chama silt loams, 15 to 70 percent slopes

Setting:

Cabba soils occur on shoulders. Sen and Chama soils occur on backslopes. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components
Cabba and similar soils: 35 to 55 percent
Sen and similar soils: 15 to 30 percent
Chama and similar soils: 10 to 25 percent

Average Component Composition
Cabba: 45 percent
Sen: 18 percent
Chama: 15 percent
Shambo: 6 percent
Regent: 5 percent
Vebar: 3 percent
Janesburg: 2 percent
Regan: 2 percent
Rock outcrop: 2 percent
Straw: 2 percent

Named Component Description

Cabba

Slope: 15 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Sen

Slope: 15 to 25 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bw—6 to 17 inches; silt loam
Bk—17 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Chama

Slope: 15 to 45 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; silt loam
Bw—4 to 8 inches; silt loam
Bk—8 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

55B—Sen-Janesburg silt loams, 0 to 6 percent slopes

Setting:

This map unit occurs on pediments on uplands.

Map Unit Composition (percent)

Named Components

Sen and similar soils: 15 to 50 percent
Janesburg and similar soils: 25 to 50 percent

Average Component Composition

Janesburg: 34 percent
Sen: 25 percent
Regent: 10 percent
Farland: 8 percent
Dogtooth: 6 percent
Chama: 5 percent
Reeder: 5 percent
Belfield: 4 percent
Cabba: 3 percent

Named Component Description

Sen

Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bw—6 to 17 inches; silt loam
Bk—17 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Janesburg

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None

Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; silt loam
E—8 to 10 inches; silt loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

56B—Lefor fine sandy loam, 0 to 6 percent slopes

Setting:

Lefor soils occur on pediments on uplands.

Map Unit Composition (percent)

Named Components
Lefor and similar soils: 70 to 90 percent

Average Component Composition
Lefor: 78 percent
Parshall: 9 percent
Vebar: 4 percent
Belfield: 2 percent
Cohagen: 2 percent
Dogtooth: 2 percent
Lihen: 2 percent
Heil: 1 percent

Named Component Description

Lefor
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None

Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; fine sandy loam
B/E—7 to 15 inches; fine sandy loam
Bt—15 to 30 inches; sandy clay loam
Bk—30 to 36 inches; fine sandy loam
Cr—36 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

56C—Lefor fine sandy loam, 6 to 9 percent slopes

Setting:

Lefor soils occur on backslopes of ridges on uplands.

Map Unit Composition (percent)

Named Components
Lefor and similar soils: 50 to 85 percent

Average Component Composition
Lefor: 65 percent
Cabba: 11 percent
Regent: 9 percent
Parshall: 5 percent
Cohagen: 4 percent
Lefor, strongly sloping: 2 percent
Tally: 2 percent
Vebar: 2 percent

Named Component Description

Lefor
Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
Ap—0 to 7 inches; fine sandy loam
B/E—7 to 15 inches; fine sandy loam
Bt—15 to 30 inches; sandy clay loam
Bk—30 to 36 inches; fine sandy loam
Cr—36 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

61D—Beisigl-Flasher loamy fine sands, 6 to 15 percent slopes

Setting:

The Beisigl soils occur on convex backslopes. The Flasher soils occur on shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components
Beisigl and similar soils: 35 to 45 percent
Flasher and similar soils: 20 to 30 percent

Average Component Composition
Beisigl: 42 percent
Flasher: 28 percent
Telfer: 13 percent
Vebar: 12 percent
Parshall: 5 percent

Named Component Description

Beisigl
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loamy fine sand

Bk—5 to 27 inches; loamy fine sand
Cr—27 to 60 inches; bedrock

Flasher
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 10 inches; loamy fine sand
Cr—10 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

61F—Beisigl-Flasher-Tally complex, 9 to 50 percent slopes

Setting:

Beisigl soils occur on convex backslopes. Flasher soils occur on shoulders. Tally soils occur on concave footslopes. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components
Beisigl and similar soils: 20 to 45 percent
Flasher and similar soils: 15 to 40 percent
Tally and similar soils: 10 to 30 percent

Average Component Composition
Beisigl: 35 percent
Flasher: 30 percent
Tally: 17 percent
Vebar: 8 percent
Amor: 4 percent
Telfer: 3 percent
Cabba: 2 percent
Regan: 1 percent

Named Component Description

Beisigl

Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loamy fine sand
Bk—5 to 27 inches; loamy fine sand
Cr—27 to 60 inches; bedrock

Flasher

Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 10 inches; loamy fine sand
Cr—10 to 60 inches; bedrock

Tally

Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bw—6 to 32 inches; fine sandy loam
Bk—32 to 60 inches; fine sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

62F—Flasher-Rock outcrop-Vebar complex, 9 to 70 percent slopes

Setting:

Flasher soils occur on shoulders. Rock outcrop occurs on shoulders and summits. Vebar soils occur on backslopes. This map unit occurs on hills and ridges on uplands.

Map Unit Composition (percent)

Named Components

Flasher and similar soils: 25 to 40 percent
Rock outcrop and similar soils: 15 to 30 percent
Vebar and similar soils: 10 to 20 percent

Average Component Composition

Flasher: 35 percent
Rock outcrop: 22 percent
Vebar: 13 percent
Beisigl: 11 percent
Tally: 6 percent
Cohagen: 4 percent
Telfer: 4 percent
Amor: 3 percent
Cabba: 2 percent

Named Component Description

Flasher

Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 10 inches; loamy fine sand
Cr—10 to 60 inches; bedrock

Rock outcrop

Slope: 9 to 99 percent
Depth to Restrictive Feature: Bedrock (lithic); top depth ranges from 0 to 1 inch
Drainage Class: —

Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Vebar
Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; fine sandy loam
Bw—5 to 26 inches; fine sandy loam
BCk—26 to 32 inches; fine sandy loam
Cr—32 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

63B—Vebar-Flasher complex, 3 to 6 percent slopes

Setting:

Vebar soils occur on convex backslopes. Flasher soils occur on shoulders. This map unit occurs on rises on uplands.

Map Unit Composition (percent)

Named Components
Vebar and similar soils: 30 to 65 percent
Flasher and similar soils: 5 to 25 percent

Average Component Composition
Vebar: 44 percent
Flasher: 12 percent
Cohagen: 11 percent
Tally: 8 percent
Amor: 6 percent

Beisigl: 6 percent
Parshall: 5 percent
Dooley: 3 percent
Janesburg: 3 percent
Arnegard: 2 percent

Named Component Description

Vebar

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; fine sandy loam
Bw—5 to 26 inches; fine sandy loam
BCk—26 to 32 inches; fine sandy loam
Cr—32 to 60 inches; bedrock

Flasher

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 10 inches; loamy fine sand
Cr—10 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

63C—Vebar-Flasher complex, 6 to 9 percent slopes

Setting:

The Vebar soils occur on convex backslopes. The Flasher soils occur on convex shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Vebar and similar soils: 45 to 70 percent
Flasher and similar soils: 5 to 20 percent

Average Component Composition

Vebar: 54 percent
Tally: 12 percent
Flasher: 10 percent
Cohagen: 9 percent
Beisigl: 6 percent
Amor: 4 percent
Arnegard: 2 percent
Zahl: 2 percent
Peta, fine sandy loam: 1 percent

Named Component Description

Vebar

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:

A—0 to 5 inches; fine sandy loam
Bw—5 to 26 inches; fine sandy loam
BCk—26 to 32 inches; fine sandy loam
Cr—32 to 60 inches; bedrock

Flasher

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 10 inches; loamy fine sand
Cr—10 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

63D—Vebar-Flasher-Tally complex, 9 to 15 percent slopes

Setting:

Vebar soils occur on backslopes. Flasher soils occur on shoulders. Tally soils occur on footslopes. This map unit occurs on hills and ridges on uplands.

Map Unit Composition (percent)

Named Components
Vebar and similar soils: 25 to 35 percent
Flasher and similar soils: 15 to 25 percent
Tally and similar soils: 10 to 20 percent

Average Component Composition
Vebar: 32 percent
Flasher: 16 percent
Tally: 15 percent
Cohagen: 12 percent
Vebar, moderately sloping: 7 percent
Beisigl: 6 percent
Parshall: 5 percent
Amor: 4 percent
Telfer: 3 percent

Named Component Description

Vebar
Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected

Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; fine sandy loam
Bw—5 to 26 inches; fine sandy loam
BCk—26 to 32 inches; fine sandy loam
Cr—32 to 60 inches; bedrock

Flasher
Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 10 inches; loamy fine sand
Cr—10 to 60 inches; bedrock

Tally
Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bw—6 to 32 inches; fine sandy loam
Bk—32 to 60 inches; fine sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

66B—Manning fine sandy loam, 0 to 6 percent slopes

Setting:

Manning soils occur on stream terraces on river valleys on uplands.

Map Unit Composition (percent)

Named Components
Manning and similar soils: 55 to 70 percent

Average Component Composition
Manning: 66 percent
Parshall: 12 percent
Stady: 12 percent
Shambo, gravelly substratum: 4 percent
Wabek: 4 percent
Vebar: 2 percent

Named Component Description

Manning
Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 24 to 40 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; fine sandy loam
Bw—5 to 18 inches; fine sandy loam
Bk—18 to 25 inches; fine sandy loam
2C—25 to 60 inches; stratified loamy sand to extremely gravelly loamy coarse sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

70B—Regent-Savage silty clay loams, 3 to 6 percent slopes

Setting:

Regent soils occur on pediments. Savage soils occur on alluvial fans. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components

Regent and similar soils: 60 to 75 percent
Savage and similar soils: 10 to 20 percent

Average Component Composition

Regent: 71 percent
Savage: 15 percent
Moreau: 6 percent
Cabba: 2 percent
Chama: 2 percent
Daglum: 2 percent
Wayden: 2 percent

Named Component Description

Regent

Slope: 3 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 10 inches; silty clay loam
Bt—10 to 26 inches; silty clay
Bk—26 to 39 inches; silty clay loam
Cr—39 to 60 inches; bedrock

Savage

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 7 inches; silty clay loam
Bt—7 to 25 inches; silty clay
Bk—25 to 51 inches; silty clay loam
C—51 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

70C—Regent-Cabba complex, 6 to 9 percent slopes

Setting:

Regent soils occur on convex backslopes. Cabba soils occur on shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Regent and similar soils: 30 to 70 percent
Cabba and similar soils: 10 to 40 percent

Average Component Composition

Regent: 43 percent
Cabba: 20 percent
Regent, gently sloping: 10 percent
Reeder: 9 percent
Moreau: 7 percent
Wayden: 7 percent
Chama: 2 percent
Savage: 2 percent

Named Component Description

Regent

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 10 inches; silty clay loam
Bt—10 to 26 inches; silty clay
Bk—26 to 39 inches; silty clay loam
Cr—39 to 60 inches; bedrock

Cabba

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None

Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

71B—Regent-Janesburg complex, 0 to 6 percent slopes

Setting:

Regent soils occur on convex backslopes. Janesburg soils occur on linear backslopes and footslopes. This map unit occurs on rises on uplands.

Map Unit Composition (percent)

Named Components
Regent and similar soils: 35 to 50 percent
Janesburg and similar soils: 20 to 35 percent

Average Component Composition
Regent: 38 percent
Janesburg: 28 percent
Belfield: 9 percent
Reeder: 9 percent
Dogtooth: 7 percent
Moreau: 4 percent
Savage: 4 percent
Chama: 1 percent

Named Component Description

Regent
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 10 inches; silty clay loam
Bt—10 to 26 inches; silty clay
Bk—26 to 39 inches; silty clay loam
Cr—39 to 60 inches; bedrock

Janesburg
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; silt loam
E—8 to 10 inches; silt loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

71C—Regent-Janesburg complex, 6 to 9 percent slopes

Setting:

Regent soils occur on convex linear backslopes. Janesburg soils occur on linear backslopes and footslopes. This map unit occurs on hills on uplands.

Map Unit Composition (percent)

Named Components
Regent and similar soils: 25 to 35 percent
Janesburg and similar soils: 25 to 35 percent

Average Component Composition
Regent: 32 percent
Janesburg: 31 percent
Regent, gently sloping: 12 percent
Belfield: 6 percent

Dogtooth: 6 percent
Moreau: 4 percent
Savage: 4 percent
Wayden: 3 percent
Chama: 2 percent

Named Component Description

Regent
Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 10 inches; silty clay loam
Bt—10 to 26 inches; silty clay
Bk—26 to 39 inches; silty clay loam
Cr—39 to 60 inches; bedrock

Janesburg
Slope: 6 to 9 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; silt loam
E—8 to 10 inches; silt loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

72B—Moreau silty clay, 0 to 6 percent slopes

Setting:

Moreau soils occur on convex rises on uplands.

Map Unit Composition (percent)

Named Components

Moreau and similar soils: 35 to 60 percent

Average Component Composition

Moreau: 46 percent
Moreau, silty clay loam: 18 percent
Wayden: 9 percent
Savage: 8 percent
Regent: 7 percent
Lawther: 6 percent
Janesburg: 4 percent
Chama: 2 percent

Named Component Description

Moreau

Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Not affected

Typical profile:

A—0 to 6 inches; silty clay
Bw—6 to 13 inches; silty clay
Bk—13 to 35 inches; silty clay
Cr—35 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

72C—Moreau-Wayden silty clays, 6 to 9 percent slopes

Setting:

Moreau soils occur on convex backslopes. Wayden soils occur on convex shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Moreau and similar soils: 30 to 60 percent
Wayden and similar soils: 10 to 40 percent

Average Component Composition

Moreau: 46 percent
Wayden: 17 percent
Lawther: 9 percent
Regent: 9 percent
Janesburg: 6 percent
Moreau, strongly sloping: 5 percent
Cabba: 3 percent
Savage: 3 percent
Dogtooth: 2 percent

Named Component Description

Moreau

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; silty clay
Bw—6 to 13 inches; silty clay
Bk—13 to 35 inches; silty clay
Cr—35 to 60 inches; bedrock

Wayden

Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Not affected

Typical profile:
A—0 to 3 inches; silty clay
C—3 to 15 inches; silty clay
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

72D—Moreau-Cabba complex, 9 to 15 percent slopes

Setting:

Moreau soils occur on convex linear backslopes. Cabba soils occur on shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components
Moreau and similar soils: 20 to 55 percent
Cabba and similar soils: 15 to 50 percent

Average Component Composition
Moreau: 30 percent
Cabba: 27 percent
Chama: 8 percent
Morton: 8 percent
Regent: 8 percent
Lawther: 6 percent
Wayden: 6 percent
Farnuf: 5 percent
Vebar: 2 percent

Named Component Description

Moreau
Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Not affected

Typical profile:
A—0 to 6 inches; silty clay
Bw—6 to 13 inches; silty clay
Bk—13 to 35 inches; silty clay
Cr—35 to 60 inches; bedrock

Cabba
Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

80—Badland, high precipitation

Setting:

Badland occurs on barren shoulders and backslopes of ridges on uplands.

Map Unit Composition (percent)

Named Components
Badland, high precipitation and similar soils: 85 to 100 percent

Average Component Composition
Badland, high precipitation: 90 percent
Cabba: 5 percent
Lambert: 4 percent
Moreau: 1 percent

Named Component Description

Badland, high precipitation
Slope: 9 to 150 percent

Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

83F—Cabba-Badland, outcrop complex, 9 to 70 percent slopes

Setting:

Cabba soils occur on summits. Badland, outcrop areas occur on shoulders and backslopes. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components
Cabba and similar soils: 25 to 65 percent
Badland, outcrop and similar soils: 20 to 55 percent

Average Component Composition
Cabba: 46 percent
Badland, outcrop: 36 percent
Chama: 4 percent
Flasher: 4 percent
Amor: 3 percent
Cherry: 3 percent
Arikara: 2 percent
Lihen: 2 percent

Named Component Description

Cabba
Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained

Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Badland, outcrop
Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; unweathered bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

84F—Cabba-Chama-Havrelon silt loams, 3 to 70 percent slopes

Setting:

Cabba soils occur on shoulders of ridges. Chama soils occur on convex backslopes of ridges. Havrelon soils occur on floodplains. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components
Cabba and similar soils: 15 to 45 percent
Chama and similar soils: 10 to 40 percent
Havrelon and similar soils: 5 to 30 percent

Average Component Composition
Cabba: 25 percent
Chama: 20 percent
Cherry: 14 percent

Havrelon: 14 percent
Amor: 12 percent
Flasher: 6 percent
Maschetah: 4 percent
Dogtooth: 3 percent
Savage: 2 percent

Named Component Description

Cabba

Slope: 6 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Chama

Slope: 6 to 35 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; silt loam
Bw—4 to 8 inches; silt loam
Bk—8 to 34 inches; silt loam
Cr—34 to 60 inches; bedrock

Havrelon

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 13 inches; silt loam
C—13 to 60 inches; stratified very fine sandy loam to silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this

map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

88D—Brandenburg-Searing-Dogtooth complex, 6 to 15 percent slopes

Setting:

Brandenburg soils occur on shoulders. Searing soils occur on summits and backslopes. Dogtooth soils occur in micro-lows on side slopes. This map unit occurs on ridges and hills of uplands.

Map Unit Composition (percent)

Named Components

Brandenburg and similar soils: 25 to 55 percent
Searing and similar soils: 15 to 45 percent
Dogtooth and similar soils: 5 to 30 percent

Average Component Composition

Brandenburg: 39 percent
Searing: 21 percent
Dogtooth: 12 percent
Regent: 7 percent
Cabba: 6 percent
Sen: 6 percent
Janesburg: 3 percent
Vebar: 3 percent
Wayden: 3 percent

Named Component Description

Brandenburg

Slope: 6 to 15 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 10 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; channery loam
C1—4 to 10 inches; very channery loam
C2—10 to 60 inches; channers

Searing

Slope: 6 to 9 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; loam
Bw—8 to 23 inches; loam
C1—23 to 33 inches; channery loam
2C2—33 to 60 inches; channers

Dogtooth

Slope: 6 to 15 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 8 inches; silty clay
Btkn—8 to 13 inches; silty clay
Bky—13 to 21 inches; silty clay
Cr—21 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, range, or cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

88F—Brandenburg-Cabba-Dogtooth complex, 15 to 70 percent slopes

Setting:

Brandenburg soils occur on shoulders. Cabba soils occur on convex backslopes. Dogtooth soils occur in micro-lows on side slopes. This map unit occurs on hills and ridges of uplands.

Map Unit Composition (percent)

Named Components

Brandenburg and similar soils: 30 to 60 percent
Cabba and similar soils: 10 to 35 percent
Dogtooth and similar soils: 5 to 25 percent

Average Component Composition

Brandenburg: 38 percent
Cabba: 17 percent
Dogtooth: 12 percent
Janesburg: 9 percent
Amor: 7 percent
Searing: 7 percent
Chama: 5 percent
Rock outcrop: 3 percent
Farnuf: 2 percent

Named Component Description

Brandenburg

Slope: 15 to 70 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 10 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; channery loam
C1—4 to 10 inches; very channery loam
C2—10 to 60 inches; channers

Cabba

Slope: 15 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Dogtooth

Slope: 15 to 25 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained

Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 8 inches; silty clay
Btkn—8 to 13 inches; silty clay
Bky—13 to 21 inches; silty clay
Cr—21 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

89F—Brandenburg-Cabba-Badland, outcrop complex, 9 to 70 percent slopes

Setting:

The Brandenburg soils occur on hills. The Cabba soils are on summits and shoulders of ridges. Badland, outcrop occurs on backslopes and shoulders of ridges. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components
Brandenburg and similar soils: 20 to 55 percent
Cabba and similar soils: 10 to 40 percent
Badland, outcrop and similar soils: 5 to 35 percent

Average Component Composition
Brandenburg: 28 percent
Cabba: 22 percent
Badland, outcrop: 16 percent
Dogtooth: 15 percent
Chama: 8 percent
Rock outcrop: 4 percent
Flasher: 2 percent
Janesburg: 2 percent
Searing: 2 percent
Lambert: 1 percent

Named Component Description

Brandenburg

Slope: 9 to 70 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 10 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; very channery loam
C1—4 to 10 inches; very channery loam
C2—10 to 60 inches; channers

Cabba

Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Badland, outcrop

Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; unweathered bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

90E—Manning-Schaller-Wabek complex, 6 to 25 percent slopes

Setting:

Manning soils occur on backslopes. Schaller and Wabek soils occur on summits and shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Manning and similar soils: 15 to 40 percent
Schaller and similar soils: 15 to 35 percent
Wabek and similar soils: 10 to 30 percent

Average Component Composition

Manning: 24 percent
Schaller: 22 percent
Wabek: 22 percent
Stady: 20 percent
Tally: 6 percent
Cabba: 4 percent
Janesburg: 2 percent

Named Component Description

Manning

Slope: 6 to 15 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 24 to 40 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; fine sandy loam
Bw—5 to 18 inches; fine sandy loam
Bk—18 to 25 inches; fine sandy loam
2C—25 to 60 inches; stratified loamy sand to extremely gravelly loamy coarse sand

Schaller

Slope: 6 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None

Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 9 inches; sandy loam
Bk—9 to 15 inches; fine sandy loam
C—15 to 60 inches; gravelly loamy coarse sand

Wabek
Slope: 9 to 25 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 7 to 14 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 9 inches; gravelly coarse sandy loam
C—9 to 60 inches; very gravelly coarse sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

91F—Wabek-Zahl complex, 9 to 35 percent slopes

Setting:

Wabek soils occur on summits and shoulders. Zahl soils occur on backslopes. This map unit occurs on ridges on till plains.

Map Unit Composition (percent)

Named Components
Wabek and similar soils: 40 to 75 percent
Zahl and similar soils: 10 to 40 percent

Average Component Composition
Wabek: 50 percent
Zahl: 27 percent
Manning: 10 percent
Williams: 6 percent
Schaller: 4 percent
Stady: 2 percent
Arnegard: 1 percent

Named Component Description

Wabek
Slope: 9 to 35 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; gravelly loam
Bk—5 to 9 inches; gravelly coarse sandy loam
C—9 to 60 inches; very gravelly coarse sand

Zahl
Slope: 9 to 35 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

93B—Lehr-Stady loams, 0 to 6 percent slopes

Setting:

The Lehr soils occur on risers. The Stady soils occur on treads. This map unit occurs on terraces along river valleys.

Map Unit Composition (percent)

Named Components
Lehr and similar soils: 30 to 50 percent
Stady and similar soils: 15 to 35 percent

Average Component Composition

Lehr: 37 percent
Stady: 27 percent
Bowdle: 16 percent
Shambo: 6 percent
Manning: 5 percent
Wanagan: 5 percent
Wabek: 4 percent

Named Component Description

Lehr

Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 14 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bw—6 to 11 inches; loam
Bk1—11 to 15 inches; loam
2Bk2—15 to 22 inches; gravelly loamy coarse sand
2C—22 to 60 inches; very gravelly coarse sand

Stady

Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bw—6 to 15 inches; loam
Bk—15 to 29 inches; loam
2C—29 to 60 inches; very gravelly coarse sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

94B—Searing-Ringling loams, 0 to 6 percent slopes

Setting:

Searing soils occur on pediments. Ringling soils occur on rises on pediments. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components

Searing and similar soils: 45 to 70 percent
Ringling and similar soils: 15 to 35 percent

Average Component Composition

Searing: 60 percent
Ringling: 19 percent
Farnuf: 7 percent
Belfield: 5 percent
Amor: 3 percent
Brandenburg: 2 percent
Cabba: 2 percent
Chama: 2 percent

Named Component Description

Searing

Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; loam
Bw—8 to 23 inches; loam
C1—23 to 33 inches; channery loam
2C2—33 to 60 inches; channers

Ringling

Slope: 2 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 12 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bw—5 to 17 inches; very channery loam
2Ck—17 to 42 inches; channers
2C—42 to 60 inches; channers

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

95—Havrelon silty clay, slightly wet, 0 to 2 percent slopes

Setting:

Havrelon soils occur on flats on floodplains in river valleys.

Map Unit Composition (percent)

Named Components

Havrelon and similar soils: 80 to 100 percent

Average Component Composition

Havrelon: 96 percent
Havrelon, silt loam: 3 percent
Lohler: 1 percent

Named Component Description

Havrelon

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 13 inches; silty clay
C—13 to 60 inches; stratified very fine sandy loam to silty clay loam

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or irrigated cropland

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

96—Pits, gravel and sand

Setting:

Pits, gravel and sand occur on stream terraces on uplands.

Map Unit Composition (percent)

Named Components

Pits, gravel and sand and similar soils: 80 to 100 percent

Average Component Composition

Pits, gravel and sand: 85 percent
Wabek: 10 percent
Lehr: 5 percent

Named Component Description

Pits, gravel and sand

Slope: 0 to 60 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
H1—0 to 6 inches; extremely gravelly sand
H2—6 to 60 inches; extremely gravelly sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

98F—Tinsley-Chanta complex, 6 to 35 percent slopes

Setting:

Tinsley soils occur on shoulders. Chanta soils occur on backslopes. This map unit occurs on escarpments on paleoterraces in river valleys.

Map Unit Composition (percent)

Named Components

Tinsley and similar soils: 45 to 70 percent
Chanta and similar soils: 10 to 40 percent

Average Component Composition

Tinsley: 53 percent
Chanta: 17 percent
Chinook: 7 percent
Cozberg: 7 percent
Cabbart: 6 percent
Rhame: 6 percent
Kremlin: 4 percent

Named Component Description

Tinsley

Slope: 6 to 35 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 2 to 7 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; gravelly sandy loam
C—3 to 60 inches; extremely gravelly loamy sand

Chanta

Slope: 6 to 15 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loam
Bw1—6 to 22 inches; loam
Bw2—22 to 26 inches; sandy loam
2C—26 to 60 inches; gravelly sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

99—Mckeen loam, 0 to 1 percent slopes

Setting:

Mckeen soils occur on flats on flood plains in river valleys.

Map Unit Composition (percent)

Named Components
Mckeen and similar soils: 60 to 85 percent

Average Component Composition
Mckeen: 73 percent
Lallie: 21 percent
Scorio, saline: 5 percent
Scorio, silty clay loam: 1 percent

Named Component Description

Mckeen
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Very poorly drained
Flooding: Frequent
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; loam
C—2 to 12 inches; loam
Ab—12 to 15 inches; silty clay
2Cg—15 to 60 inches; stratified loamy fine sand to silty clay

Mapunit Notes: This map unit may rarely flood due to protection by dam and dike structures.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

100F—Boxwell-Cabbart-Arikara complex, 9 to 50 percent slopes

Setting:

Boxwell soils occur on backslopes. Cabbart soils occur on summits and shoulders. Arikara soils occur on wooded backslopes and footslopes. This map unit occurs on ridges in badlands. (fig. 13)

Map Unit Composition (percent)

Named Components

Boxwell and similar soils: 20 to 50 percent
Cabbart and similar soils: 20 to 45 percent
Arikara and similar soils: 10 to 30 percent

Average Component Composition

Boxwell: 34 percent
Cabbart: 32 percent
Arikara: 16 percent
Rhame: 5 percent
Ethridge: 4 percent
Maltese: 3 percent
Scairt: 3 percent
Fleak: 2 percent
Badland, outcrop: 1 percent



Figure 13. An area of Boxwell-Cabbart-Arikara complex, 9 to 50 percent slopes.

Named Component Description

Boxwell

Slope: 9 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 28 inches; loam
Cr—28 to 60 inches; bedrock

Cabbart

Slope: 9 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 18 inches; loam
Cr—18 to 60 inches; bedrock

Arikara

Slope: 15 to 50 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

101F—Cabbart-Badland, outcrop complex, 6 to 70 percent slopes

Setting:

Cabbart soils occur on summits and shoulders. Badland occurs on barren shoulders and backslopes. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components

Cabbart and similar soils: 35 to 55 percent
Badland, outcrop and similar soils: 15 to 30 percent

Average Component Composition

Cabbart: 41 percent
Badland, outcrop: 27 percent
Boxwell: 6 percent
Patent: 6 percent
Blacksheep: 5 percent
Fleak: 5 percent
Kirby: 4 percent
Kremlin: 4 percent
Gerda: 2 percent

Named Component Description

Cabbart

Slope: 6 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 18 inches; loam
Cr—18 to 60 inches; bedrock

Badland, outcrop

Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches

Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

102B—Kremlin-Ethridge-Gerda complex, 1 to 6 percent slopes

Setting:

This map unit occurs on alluvial fans in badlands.

Map Unit Composition (percent)

Named Components
Kremlin and similar soils: 15 to 40 percent
Ethridge and similar soils: 10 to 35 percent
Gerda and similar soils: 5 to 25 percent

Average Component Composition
Kremlin: 26 percent
Ethridge: 22 percent
Gerda: 19 percent
Maltese: 19 percent
Boxwell: 12 percent
Patent: 2 percent

Named Component Description

Kremlin
Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None

Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 11 inches; loam
Bw—11 to 19 inches; loam
Bk—19 to 60 inches; loam

Ethridge
Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 3 inches; silt loam
Bt—3 to 10 inches; silty clay loam
Btk—10 to 23 inches; silty clay loam
Bk—23 to 38 inches; silty clay loam
Bky—38 to 60 inches; silt loam

Gerda
Slope: 1 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 0 to 3 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; loam
Btn—2 to 11 inches; silty clay
Btkny—11 to 19 inches; silty clay
Bky—19 to 29 inches; silty clay loam
Bk—29 to 44 inches; silty clay
C—44 to 80 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

103B—Chinook-Rhame fine sandy loams, 1 to 6 percent slopes

Setting:

Chinook soils occur on alluvial fans. Rhame soils occur on pediments. This map unit is in badlands.

Map Unit Composition (percent)

Named Components

Chinook and similar soils: 30 to 60 percent
Rhame and similar soils: 15 to 40 percent

Average Component Composition

Chinook: 42 percent
Rhame: 28 percent
Kremlin: 12 percent
Boxwell: 5 percent
Chinook, moderately sloping: 5 percent
Blacksheep: 3 percent
Ethridge: 3 percent
Maltese: 2 percent

Named Component Description

Chinook

Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; fine sandy loam
Bw—6 to 15 inches; fine sandy loam
Bk—15 to 40 inches; fine sandy loam
BC—40 to 66 inches; fine sandy loam

Rhame

Slope: 1 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; fine sandy loam
B—8 to 26 inches; fine sandy loam
C—26 to 34 inches; fine sandy loam
Cr—34 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range, pasture, hayland or cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

103D—Rhame-Chinook fine sandy loams, 6 to 15 percent slopes

Setting:

Rhame soils occur on backslopes. Chinook soils occur on footslopes. This map unit occurs on hills and ridges in badlands.

Map Unit Composition (percent)

Named Components

Rhame and similar soils: 35 to 60 percent
Chinook and similar soils: 25 to 40 percent

Average Component Composition

Rhame: 42 percent
Chinook: 32 percent
Kremlin: 10 percent
Tusler: 5 percent
Blacksheep: 4 percent
Fleak: 4 percent
Maltese: 2 percent
Burgraff: 1 percent

Named Component Description

Rhame

Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; fine sandy loam
B—8 to 26 inches; fine sandy loam
C—26 to 34 inches; fine sandy loam
Cr—34 to 60 inches; bedrock

Chinook
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; fine sandy loam
Bw—6 to 15 inches; fine sandy loam
Bk—15 to 40 inches; fine sandy loam
BC—40 to 66 inches; fine sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range, pasture, hayland, or cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

103F—Rhame-Fleak complex, 9 to 50 percent slopes

Setting:

Rhame soils occur on backslopes. Fleak soils occur on summits and shoulders. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components
Rhame and similar soils: 20 to 40 percent
Fleak and similar soils: 15 to 35 percent

Average Component Composition
Rhame: 29 percent
Fleak: 27 percent
Chinook: 10 percent
Blacksheep: 7 percent
Cabbart: 6 percent
Rhame, strongly sloping: 6 percent
Tusler: 5 percent
Kremlin: 4 percent
Rock outcrop: 4 percent
Gerda: 2 percent

Named Component Description

Rhame

Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; fine sandy loam
B—8 to 26 inches; fine sandy loam
C—26 to 34 inches; fine sandy loam
Cr—34 to 60 inches; bedrock

Fleak

Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loamy fine sand
C—3 to 17 inches; loamy fine sand
Cr—17 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

104E—Badland, outcrop-Patent complex, 6 to 25 percent slopes

Setting:

Badland occurs on barren shoulders and backslopes of ridges. Patent soils occur on alluvial fans. This map unit occurs in badlands.

Map Unit Composition (percent)

Named Components

Badland, outcrop and similar soils: 45 to 70 percent
Patent and similar soils: 20 to 45 percent

Average Component Composition

Badland, outcrop: 54 percent
Patent: 25 percent
Patent, moderately steep: 7 percent
Cabbart: 6 percent
Lonna: 5 percent
Scoria outcrop: 2 percent
Havre: 1 percent

Named Component Description

Badland, outcrop

Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Patent

Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Sodic within 30 inches
Typical profile:
AC—0 to 7 inches; loam
C—7 to 60 inches; stratified fine sandy loam to silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

105—Havre silt loam, 0 to 3 percent slopes

Setting:

Havre soils occur on flood plains in river valleys.

Map Unit Composition (percent)

Named Components

Havre and similar soils: 60 to 85 percent

Average Component Composition

Havre: 77 percent
Havre, loam: 9 percent
Glendive: 6 percent
Channel: 5 percent
Kremlin: 2 percent
Wolf Point: 1 percent

Named Component Description

Havre

Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 10 inches; silt loam
C—10 to 60 inches; stratified fine sandy loam to clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, hayland, pasture, or range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

106—Glendive fine sandy loam, 0 to 3 percent slopes

Setting:

Glendive soils occur on flood plains in river valleys.

Map Unit Composition (percent)

Named Components
Glendive and similar soils: 55 to 80 percent

Average Component Composition
Glendive: 70 percent
Hanly: 11 percent
Glendive, loam: 10 percent
Channel: 5 percent
Havre: 4 percent

Named Component Description

Glendive
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; fine sandy loam
C1—5 to 16 inches; loam
C2—16 to 60 inches; stratified loamy fine sand to silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland or range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

107—Kremlin loam, 0 to 3 percent slopes

Setting:

Kremlin soils occur on treads on paleoterraces in river valleys.

Map Unit Composition (percent)

Named Components
Kremlin and similar soils: 60 to 85 percent

Average Component Composition
Kremlin: 77 percent
Littlemo: 8 percent
Chanta: 5 percent

Chinook: 5 percent
Haydraw: 5 percent

Named Component Description

Kremlin
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 11 inches; loam
Bw—11 to 19 inches; loam
Bk—19 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

108B—Hanly fine sandy loam, 0 to 6 percent slopes

Setting:

Hanly soils occur on floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Hanly and similar soils: 75 to 90 percent

Average Component Composition
Hanly: 81 percent
Glendive: 17 percent
Minnewaukan: 1 percent
Riverwash: 1 percent

Named Component Description

Hanly
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Somewhat excessively drained
Flooding: Occasional

Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; fine sandy loam
C—5 to 60 inches; stratified loamy sand to fine sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

109—Havre silt loam, wooded, 0 to 1 percent slopes

Setting:

Havre soils occur on wooded flood plains in river valleys. (fig. 14)



Figure 14. Excellent cover is provided for wildlife in an area of Havre silt loam, wooded, 0 to 1 percent slopes.

Map Unit Composition (percent)

Named Components
Havre, wooded and similar soils: 75 to 95 percent

Average Component Composition
Havre, wooded: 80 percent
Glendive, wooded: 8 percent
Channel: 5 percent
Wolf Point: 4 percent
Kremlin: 2 percent
Harriet: 1 percent

Named Component Description

Havre, wooded
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 10 inches; silt loam
C—10 to 60 inches; stratified fine sandy loam to clay loam

Mapunit Notes: Some areas have intermixed stands of conifers and hardwoods that may affect wildlife, range, and other interpretations. These stands may be dependent on landscape position, slope, or aspect.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

110B—Maltese-Gerda complex, 0 to 6 percent slopes

Setting:

Maltese soils occur on micro-highs. Gerda soils occur in micro-lows. This map unit occurs on alluvial flats and alluvial fans in badlands.

Map Unit Composition (percent)

Named Components

Maltese and similar soils: 30 to 60 percent
Gerda and similar soils: 20 to 40 percent

Average Component Composition

Maltese: 39 percent
Gerda: 30 percent
Tanna: 12 percent
Kremlin: 8 percent
Scairt: 7 percent
Lonna: 2 percent
Rhame: 1 percent
Slickspots: 1 percent

Named Component Description

Maltese

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 15 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 7 inches; silt loam
E—7 to 10 inches; silt loam
Btn—10 to 16 inches; silty clay
Btkn—16 to 20 inches; silty clay
Btkny—20 to 33 inches; silty clay loam
BCy—33 to 60 inches; silty clay loam

Gerda

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 0 to 3 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; loam
Btn—2 to 11 inches; silty clay
Btkny—11 to 19 inches; silty clay
Bky—19 to 29 inches; silty clay loam
Bk—29 to 44 inches; silty clay
C—44 to 80 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

111D—Gerda-Kirby complex, 1 to 15 percent slopes

Setting:

Gerda soils occur in footslopes. Kirby soils occur on summits and shoulders. This map unit occurs on hills and ridges in badlands.

Map Unit Composition (percent)

Named Components

Kirby and similar soils: 15 to 30 percent
Gerda and similar soils: 15 to 40 percent

Average Component Composition

Kirby: 23 percent
Scairt: 18 percent
Gerda: 16 percent
Kremlin: 11 percent
Absher: 9 percent
Maltese: 9 percent
Searing, aridic-ustic: 5 percent
Cabbart: 4 percent
Ethridge: 4 percent
Harriet: 1 percent

Named Component Description

Kirby

Slope: 6 to 15 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 12 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; very channery loam
Bk—4 to 12 inches; extremely channery loam
2C—12 to 60 inches; channers

Gerda

Slope: 1 to 9 percent
Depth to Restrictive Feature: Natric; top depth ranges from 0 to 3 inches
Drainage Class: Well drained
Flooding: None

Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; loam
Btn—2 to 11 inches; silty clay
Btkny—11 to 19 inches; silty clay
Bky—19 to 29 inches; silty clay loam
Bk—29 to 44 inches; silty clay
C—44 to 80 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

111F—Kirby-Scairt complex, 9 to 70 percent slopes

Setting:

Kirby soils occur on summits and shoulders. Scairt soils occur in micro-lows on side slopes. This map unit occurs on ridges and hills in badlands.

Map Unit Composition (percent)

Named Components
Kirby and similar soils: 35 to 65 percent
Scairt and similar soils: 5 to 30 percent

Average Component Composition
Kirby: 49 percent
Scairt: 16 percent
Cabbart: 9 percent
Kremlin: 8 percent
Searing, aridic-ustic: 7 percent
Boxwell: 3 percent
Maltese: 3 percent
Rhame: 3 percent
Badland, outcrop: 2 percent

Named Component Description

Kirby
Slope: 9 to 70 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 12 to 20 inches

Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; very channery loam
Bk—4 to 12 inches; extremely channery loam
2C—12 to 60 inches; channers

Scairt
Slope: 9 to 25 percent
Depth to Restrictive Feature: Natric; top depth ranges from 1 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 6 inches; silty clay
Btnz—6 to 13 inches; silty clay loam
Bkz—13 to 22 inches; silty clay loam
BCy—22 to 28 inches; silty clay loam
Cr—28 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

112F—Kirby-Badland, outcrop-Patent complex, 9 to 70 percent slopes

Setting:

Kirby soils occur on shoulders of ridges. Badland occurs on barren shoulders and backslopes of ridges. Patent soils occur on alluvial fans. This map unit occurs in badlands.

Map Unit Composition (percent)

Named Components

Kirby and similar soils: 25 to 50 percent
Badland, outcrop and similar soils: 15 to 40 percent
Patent and similar soils: 10 to 30 percent

Average Component Composition

Kirby: 39 percent
Badland, outcrop: 23 percent
Cabbart: 13 percent
Patent: 13 percent
Patent, strongly sloping: 6 percent
Maltese: 4 percent
Kremlin: 2 percent

Named Component Description

Kirby

Slope: 9 to 70 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 12 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; very channery loam
Bk—4 to 12 inches; extremely channery loam
2C—12 to 60 inches; channers

Badland, outcrop

Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Patent

Slope: 15 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
AC—0 to 7 inches; loam
C—7 to 60 inches; stratified fine sandy loam to silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

113F—Lonna-Cabbart silt loams, 6 to 35 percent slopes

Setting:

Lonna soils occur on alluvial fans. Cabbart soils occur on summits and shoulders of ridges. This map unit occurs in badlands.

Map Unit Composition (percent)

Named Components
Lonna and similar soils: 20 to 40 percent
Cabbart and similar soils: 25 to 45 percent

Average Component Composition
Lonna: 34 percent
Cabbart: 33 percent
Lonna, moderately steep: 14 percent
Kremlin: 7 percent
Gerda: 4 percent
Blacksheep: 3 percent
Ethridge: 3 percent
Arikara: 2 percent

Named Component Description

Lonna
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; silt loam
Bw—2 to 11 inches; silt loam

Bk—11 to 34 inches; silt loam
C—34 to 60 inches; silt loam

Cabbart
Slope: 6 to 35 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 18 inches; silt loam
Cr—18 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

114—Glendive and Havre soils, channeled, 0 to 3 percent slopes

Setting:

Glendive and Havre soils occur on flood plains in badlands.

Map Unit Composition (percent)

Named Components
Channel and similar soils: 10 to 70 percent
Glendive and similar soils: 0 to 80 percent
Havre and similar soils: 0 to 80 percent

Average Component Composition
Channel: 40 percent
Glendive: 35 percent
Havre: 18 percent
Hanly: 3 percent
Lonna: 3 percent
Regan: 1 percent

Named Component Description

Channel
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: —
Flooding: Very frequent
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Glendive
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Rare
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; fine sandy loam
C1—5 to 16 inches; loam
C2—16 to 60 inches; stratified loamy fine sand to silt loam

Havre
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Rare
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 10 inches; silt loam
C—10 to 60 inches; stratified fine sandy loam to clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

115F—Badland, outcrop-Arikara-Cabbart complex, 15 to 70 percent slopes

Setting:

Badland occurs on barren shoulders and backslopes. Arikara soils occur on wooded backslopes and footslopes. Cabbart soils occur on shoulders and summits. This map unit occurs on ridges in badlands. (fig. 15)

Map Unit Composition (percent)

Named Components

Badland, outcrop and similar soils: 20 to 40 percent
Arikara and similar soils: 15 to 40 percent
Cabbart and similar soils: 10 to 30 percent

Average Component Composition

Badland, outcrop: 30 percent
Arikara: 28 percent
Cabbart: 16 percent
Boxwell: 12 percent
Lonna: 9 percent
Kirby: 2 percent
Rhame: 2 percent
Scairt: 1 percent

Named Component Description

Badland, outcrop

Slope: 9 to 150 percent



Figure 15. An area of Badland, outcrop-Arikara-Cabbart complex, 15 to 70 percent slopes.

Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Arikara

Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Cabbart

Slope: 15 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 18 inches; loam
Cr—18 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

116F—Kremlin-Cabbart loams, slumped, 9 to 40 percent slopes

Setting:

Kremlin soils occur on footslopes. Cabbart soils occur on summits and shoulders. This map unit occurs on ridges that are slumped in badlands.

Map Unit Composition (percent)

Named Components

Kremlin and similar soils: 15 to 45 percent
Cabbart and similar soils: 15 to 50 percent

Average Component Composition

Cabbart: 29 percent
Kremlin: 19 percent
Boxwell: 17 percent
Scairt: 14 percent
Lonna: 13 percent
Badland, outcrop: 5 percent
Fleak: 3 percent

Named Component Description

Kremlin

Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 11 inches; loam
Bw—11 to 19 inches; loam
Bk—19 to 60 inches; loam

Cabbart

Slope: 9 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 18 inches; loam
Cr—18 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this

map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

117—Wolf Point silty clay loam, 0 to 1 percent slopes

Setting:

Wolf Point soils occur on floodplains in river valleys.

Map Unit Composition (percent)

Named Components

Wolf Point and similar soils: 70 to 95 percent

Average Component Composition

Wolf Point: 85 percent
Havre: 7 percent
Channel: 5 percent
Ethridge: 2 percent
Glendive: 1 percent

Named Component Description

Wolf Point

Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A1—0 to 1 inches; silty clay loam
A2—1 to 10 inches; clay
C—10 to 60 inches; silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section "Soil Series and Their Morphology." Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Cropland, pasture, hayland, or range and wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following

sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

118F—Lonna-Kirby-Cabbart complex, 3 to 50 percent slopes

Setting:

Lonna soils occur on footslopes on hills and ridges and on alluvial fans. Kirby and Cabbart soils occur on shoulders on hills and ridges. This map unit occurs in badlands.

Map Unit Composition (percent)

Named Components

Lonna and similar soils: 20 to 55 percent
Kirby and similar soils: 20 to 40 percent
Cabbart and similar soils: 5 to 25 percent

Average Component Composition

Lonna: 35 percent
Kirby: 34 percent
Cabbart: 16 percent
Boxwell: 8 percent
Maltese: 3 percent
Scairt: 2 percent
Scoria outcrop: 2 percent

Named Component Description

Lonna

Slope: 3 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; silt loam
Bw—2 to 11 inches; silt loam
Bk—11 to 34 inches; silt loam
C—34 to 60 inches; silt loam

Kirby

Slope: 6 to 50 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 12 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 4 inches; very channery loam
Bk—4 to 12 inches; extremely channery loam
2C—12 to 60 inches; channers

Cabbart
Slope: 6 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 18 inches; silt loam
Cr—18 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

119F—Patent-Badland, outcrop-Cabbart complex, 6 to 50 percent slopes

Setting:

Patent soils occur on alluvial fans. Badland occurs on barren shoulders and backslopes of ridges. Cabbart soils occur on summits and shoulders of ridges. This map unit occurs in badlands. (fig. 16)

Map Unit Composition (percent)

Named Components
Patent and similar soils: 20 to 45 percent
Badland, outcrop and similar soils: 15 to 35 percent
Cabbart and similar soils: 10 to 30 percent

Average Component Composition
Patent: 33 percent
Badland, outcrop: 21 percent
Cabbart: 21 percent
Lonna: 10 percent
Gerda: 4 percent



Figure 16. An area of Patent-Badland,outcrop-Cabbart complex, 6 to 50 percent slopes.

Kremlin: 4 percent
Arikara: 3 percent
Kirby: 2 percent
Maltese: 2 percent

Named Component Description

Patent

Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
AC—0 to 7 inches; loam
C—7 to 60 inches; stratified fine sandy loam to clay loam

Badland, outcrop

Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches

Typical profile:
H1—0 to 60 inches; bedrock

Cabbart
Slope: 9 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 18 inches; loam
Cr—18 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

121F—Maltese-Lonna-Arikara complex, 3 to 50 percent slopes

Setting:

Maltese soils occur on footslopes. Lonna soils occur on backslopes. Arikara soils occur on wooded backslopes and footslopes. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components
Maltese and similar soils: 15 to 40 percent
Lonna and similar soils: 15 to 40 percent
Arikara and similar soils: 15 to 40 percent

Average Component Composition
Maltese: 25 percent
Lonna: 24 percent
Arikara: 22 percent
Scairt: 12 percent
Tanna: 7 percent
Cabbart: 6 percent

Lallie: 2 percent
Yawdim: 2 percent

Named Component Description

Maltese
Slope: 3 to 15 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 15 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 7 inches; silt loam
E—7 to 10 inches; silt loam
Btn—10 to 16 inches; silty clay
Btkn—16 to 20 inches; silty clay
Btkny—20 to 33 inches; silty clay loam
BCy—33 to 60 inches; silty clay loam

Lonna
Slope: 3 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; silt loam
Bw—2 to 11 inches; silt loam
Bk—11 to 34 inches; silt loam
C—34 to 60 inches; silt loam

Arikara
Slope: 15 to 50 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this

map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

127—Maschetah silt loam, 0 to 2 percent slopes

Setting:

Maschetah soils occur on alluvial flats on uplands.

Map Unit Composition (percent)

Named Components

Maschetah and similar soils: 65 to 90 percent

Average Component Composition

Maschetah: 82 percent
Cherry: 6 percent
Farnuf: 6 percent
Grassna: 4 percent
Belfield: 1 percent
Straw: 1 percent

Named Component Description

Maschetah

Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 7 inches; silt loam
Bk—7 to 48 inches; silt loam
C—48 to 90 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section "Soil Series and Their Morphology." Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

127B—Maschetah silt loam, 2 to 6 percent slopes

Setting:

Maschetah soils occur on footslopes of alluvial fans on uplands.

Map Unit Composition (percent)

Named Components
Maschetah and similar soils: 65 to 95 percent

Average Component Composition
Maschetah: 87 percent
Cherry: 9 percent
Golva: 4 percent

Named Component Description

Maschetah
Slope: 2 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 7 inches; silt loam
Bk—7 to 48 inches; silt loam
C—48 to 90 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

127C—Maschetah silt loam, 6 to 9 percent slopes

Setting:

Maschetah soils occur on footslopes and backslopes of alluvial fans on uplands.

Map Unit Composition (percent)

Named Components
Maschetah and similar soils: 45 to 85 percent

Average Component Composition
Maschetah: 70 percent
Cherry: 8 percent
Cherry, strongly sloping: 7 percent
Golva: 5 percent
Maschetah, strongly sloping: 5 percent
Chama: 3 percent
Daglum: 2 percent

Named Component Description

Maschetah
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 7 inches; silt loam
Bk—7 to 48 inches; silt loam
C—48 to 90 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

131B—Lonna silt loam, 1 to 6 percent slopes

Setting:

Lonna soils occur on alluvial fans in badlands.

Map Unit Composition (percent)

Named Components
Lonna and similar soils: 70 to 95 percent

Average Component Composition
Lonna: 87 percent
Ethridge: 5 percent
Patent: 4 percent
Lonna, moderately sloping: 2 percent
Maltese: 2 percent

Named Component Description

Lonna
Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; silt loam
Bw—2 to 11 inches; silt loam
Bk—11 to 34 inches; silt loam
C—34 to 60 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

131C—Lonna silt loam, 6 to 9 percent slopes

Setting:

Lonna soils occur on alluvial fans in badlands.

Map Unit Composition (percent)

Named Components
Lonna and similar soils: 55 to 80 percent

Average Component Composition
Lonna: 64 percent
Lonna, gently sloping: 18 percent
Patent: 8 percent
Kremlin: 7 percent
Sham: 2 percent
Cabbart: 1 percent

Named Component Description

Lonna
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; silt loam
Bw—2 to 11 inches; silt loam
Bk—11 to 34 inches; silt loam
C—34 to 60 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

132C—Patent-Gerda-Slickspots complex, 1 to 9 percent slopes

Setting:

Patent soils occur on alluvial fans. Gerda soils occur in micro-lows on alluvial fans and alluvial flats. Slickspots occur on barren alluvial fans or alluvial flats. This map unit occurs in badlands.

Map Unit Composition (percent)

Named Components
Patent and similar soils: 30 to 50 percent
Gerda and similar soils: 20 to 40 percent
Slickspots and similar soils: 5 to 15 percent

Average Component Composition
Patent: 38 percent
Gerda: 27 percent
Slickspots: 10 percent
Benz: 6 percent
Haydraw: 6 percent
Ethridge: 5 percent
Chinook: 3 percent

Sham: 3 percent
Yawdim: 2 percent

Named Component Description

Patent
Slope: 1 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
AC—0 to 7 inches; loam
C—7 to 60 inches; stratified fine sandy loam to silty clay loam

Gerda
Slope: 1 to 9 percent
Depth to Restrictive Feature: Natric; top depth ranges from 0 to 3 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; loam
Btn—2 to 11 inches; silty clay
Btkny—11 to 19 inches; silty clay
Bky—19 to 29 inches; silty clay loam
Bk—29 to 44 inches; silty clay
C—44 to 80 inches; silt loam

Slickspots
Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 1 inches; silty clay
H2—1 to 60 inches; stratified loam to silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

138E—Scairt-Maltese-Boxwell complex, 3 to 25 percent slopes

Setting:

Scairt soils occur in micro-lows on backslopes. Maltese soils occur on micro-highs on footslopes. Boxwell soils occur on backslopes. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components

Scairt and similar soils: 20 to 45 percent
Maltese and similar soils: 10 to 35 percent
Boxwell and similar soils: 5 to 20 percent

Average Component Composition

Scairt: 31 percent
Maltese: 22 percent
Gerda: 12 percent
Boxwell: 10 percent
Cabbart: 10 percent
Kremlin: 7 percent
Burgraff: 4 percent
Rhame: 2 percent
Yawdim: 2 percent

Named Component Description

Scairt

Slope: 6 to 15 percent
Depth to Restrictive Feature: Natric; top depth ranges from 1 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 6 inches; silty clay
Btnz—6 to 13 inches; silty clay loam
Bkz—13 to 22 inches; silty clay loam
BCy—22 to 28 inches; silty clay loam
Cr—28 to 60 inches; bedrock

Maltese

Slope: 3 to 25 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 15 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 7 inches; silt loam
E—7 to 10 inches; silt loam
Btn—10 to 16 inches; silty clay
Btkn—16 to 20 inches; silty clay
Btkny—20 to 33 inches; silty clay loam
BCy—33 to 60 inches; silty clay loam

Boxwell

Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 28 inches; loam
Cr—28 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

145F—Zahl-Cabba-Arikara complex, 9 to 70 percent slopes

Setting:

Zahl soils occur on summits and shoulders. Cabba soils occur on convex backslopes. Arikara soils occur on concave and linear backslopes and footslopes. This map unit occurs on ridges on till-mantled residual uplands.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 15 to 35 percent
Cabba and similar soils: 15 to 30 percent
Arikara and similar soils: 15 to 30 percent

Average Component Composition

Zahl: 23 percent
Cabba: 21 percent
Arikara: 20 percent
Williams: 12 percent
Chama: 7 percent
Straw: 6 percent
Amor: 3 percent
Savage: 3 percent
Wabek: 3 percent
Dogtooth: 2 percent

Named Component Description

Zahl

Slope: 9 to 60 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Cabba

Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Arikara

Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None

Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

146B—Dooley fine sandy loam, 0 to 6 percent slopes

Setting:

Dooley soils occur on flats and rises on sand mantled till plains.

Map Unit Composition (percent)

Named Components
Dooley and similar soils: 45 to 80 percent

Average Component Composition
Dooley: 60 percent
Livona: 13 percent
Tally: 11 percent
Flaxton: 7 percent
Williams: 4 percent
Arnegard: 3 percent
Lihen: 2 percent

Named Component Description

Dooley
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bt—6 to 15 inches; sandy clay loam
Bk—15 to 24 inches; sandy loam
2C—24 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

151B—Boxwell-Kremlin loams, 1 to 6 percent slopes

Setting:

Boxwell soils occur on pediments. Kremlin soils occur on alluvial flats and alluvial fans. This map unit occurs in badlands.

Map Unit Composition (percent)

Named Components
Boxwell and similar soils: 30 to 60 percent
Kremlin and similar soils: 30 to 55 percent

Average Component Composition
Boxwell: 46 percent
Kremlin: 43 percent
Rhame: 4 percent
Burgraff: 2 percent
Chanta: 2 percent
Gerda: 2 percent
Cabbart: 1 percent

Named Component Description

Boxwell
Slope: 1 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
Ap—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 28 inches; loam
Cr—28 to 60 inches; bedrock

Kremlin
Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 11 inches; loam
Bw—11 to 19 inches; loam
Bk—19 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

151D—Boxwell-Kremlin loams, 6 to 15 percent slopes

Setting:

Boxwell soils occur on backslopes. Kremlin soils occur on footslopes. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components
Boxwell and similar soils: 25 to 55 percent
Kremlin and similar soils: 15 to 35 percent

Average Component Composition
Boxwell: 38 percent
Kremlin: 28 percent
Cabbart: 8 percent
Kremlin, gently sloping: 8 percent

Boxwell, gently sloping: 5 percent
Burgraff: 5 percent
Haydraw: 4 percent
Blacksheep: 2 percent
Maltese: 2 percent

Named Component Description

Boxwell

Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 28 inches; loam
Cr—28 to 60 inches; bedrock

Kremlin

Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 11 inches; loam
Bw—11 to 19 inches; loam
Bk—19 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

154F—Arikara-Shambo-Cabba loams, 9 to 70 percent slopes

Setting:

Arikara soils occur on wooded backslopes and footslopes. Shambo soils occur on footslopes. Cabba soils occur on summits and shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Arikara and similar soils: 20 to 40 percent
Shambo and similar soils: 15 to 35 percent
Cabba and similar soils: 10 to 25 percent

Average Component Composition

Arikara: 33 percent
Shambo: 21 percent
Cabba: 18 percent
Lambert: 12 percent
Chama: 6 percent
Tally: 4 percent
Badland, outcrop: 2 percent
Daglum: 2 percent
Regent: 2 percent

Named Component Description

Arikara

Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Shambo

Slope: 9 to 35 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 9 inches; loam
Bw1—9 to 13 inches; loam
Bw2—13 to 29 inches; loam
Bk—29 to 48 inches; loam
C—48 to 60 inches; loam

Cabba
Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

161F—Beisigl-Flasher-Arikara complex, 15 to 70 percent slopes

Setting:

Beisigl soils occur on convex backslopes. Flasher soils occur on summits and shoulders. Arikara soils occur on concave backslopes and footslopes. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components
Beisigl and similar soils: 20 to 45 percent
Flasher and similar soils: 15 to 40 percent
Arikara and similar soils: 15 to 35 percent

Average Component Composition
Beisigl: 35 percent
Flasher: 30 percent

Arikara: 24 percent
Vebar: 6 percent
Cabba: 2 percent
Telfer: 2 percent
Regan: 1 percent

Named Component Description

Beisigl
Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loamy fine sand
Bk—5 to 27 inches; loamy fine sand
Cr—27 to 60 inches; bedrock

Flasher
Slope: 15 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 10 inches; loamy fine sand
Cr—10 to 60 inches; bedrock

Arikara
Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this

map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

164D—Vebar fine sandy loam, 3 to 15 percent slopes, extremely stony

Setting:

Vebar soils occur on backslopes of rises and ridges on uplands.

Map Unit Composition (percent)

Named Components

Vebar, extremely stony and similar soils: 65 to 90 percent

Average Component Composition

Vebar, extremely stony: 80 percent
Arnegard: 4 percent
Tally: 4 percent
Williams, extremely stony: 4 percent
Cohagen, extremely stony: 3 percent
Rhoades: 3 percent
Flaxton, very stony: 2 percent

Named Component Description

Vebar, extremely stony

Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:

A—0 to 5 inches; extremely stony fine sandy loam
Bw—5 to 26 inches; fine sandy loam
BCk—26 to 32 inches; fine sandy loam
Cr—32 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section "Soil Series and Their Morphology." Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

171—Lohler silty clay, saline, 0 to 1 percent slopes

Setting:

Lohler soils occur on flats on floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Lohler, moderately saline and similar soils: 75 to 95 percent

Average Component Composition
Lohler, moderately saline: 86 percent
Lohler, slightly saline: 10 percent
Lohler, strongly saline: 4 percent

Named Component Description

Lohler, moderately saline
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Not affected
Typical profile:
Ap—0 to 8 inches; silty clay
C—8 to 60 inches; stratified silty clay

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, irrigated cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

180—Badland

Setting:

Badlands occur on barren shoulders and backslopes in badlands.

Map Unit Composition (percent)

Named Components
Badland and similar soils: 80 to 100 percent

Average Component Composition
Badland: 88 percent
Cabbart: 5 percent
Patent: 5 percent
Scoria outcrop: 2 percent

Named Component Description

Badland
Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

183F—Badland, outcrop-Cabba complex, 9 to 70 percent slopes

Setting:

Badland, outcrop occurs on barren shoulders and backslopes. Cabba soils occur on shoulders. This map unit occurs on escarpments on uplands.

Map Unit Composition (percent)

Named Components

Badland, outcrop and similar soils: 40 to 65 percent
Cabba and similar soils: 20 to 40 percent

Average Component Composition

Badland, outcrop: 51 percent
Cabba: 32 percent
Dogtooth: 5 percent
Brandenburg: 4 percent
Chama: 3 percent
Lambert: 3 percent
Rock outcrop: 2 percent

Named Component Description

Badland, outcrop

Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Cabba

Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

187F—Arikara-Cabbart loams, 15 to 70 percent slopes

Setting:

Arikara soils occur on concave and linear backslopes and footslopes. Cabbart soils occur on shoulders. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components

Arikara and similar soils: 50 to 85 percent
Cabbart and similar soils: 19 to 45 percent

Average Component Composition

Arikara: 70 percent
Cabbart: 26 percent
Havre: 2 percent
Patent: 2 percent

Named Component Description

Arikara

Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Cabbart

Slope: 15 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 3 inches; loam
Bk—3 to 18 inches; loam
Cr—18 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

193B—Chanta loam, 0 to 6 percent slopes

Setting:

Chanta soils occur on flats and rises on paleoterraces in river valleys in badlands.

Map Unit Composition (percent)

Named Components
Chanta and similar soils: 60 to 90 percent

Average Component Composition
Chanta: 81 percent
Kremlin: 15 percent
Tinsley: 4 percent

Named Component Description

Chanta
Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; loam
Bw1—6 to 22 inches; loam
Bw2—22 to 26 inches; sandy loam
2C—26 to 60 inches; gravelly sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, hayland, or range

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

194F—Kirby-Arikara-Badland, outcrop complex, 15 to 70 percent slopes

Setting:

Kirby soils occur on shoulders. Arikara soils occur on wooded backslopes and footslopes. Badland occurs on barren shoulders and backslopes. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components

Kirby and similar soils: 35 to 60 percent
Arikara and similar soils: 15 to 35 percent
Badland, outcrop and similar soils: 5 to 25 percent

Average Component Composition

Kirby: 42 percent
Arikara: 27 percent
Badland, outcrop: 16 percent
Patent: 7 percent
Cabbart: 4 percent
Lonna: 2 percent
Scairt: 2 percent

Named Component Description

Kirby

Slope: 15 to 70 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 12 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; very channery loam
Bk—4 to 12 inches; extremely channery loam
2C—12 to 60 inches; channers

Arikara

Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained

Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Badland, outcrop
Slope: 15 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; unweathered bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

195—Havrelon silty clay loam, saline, 0 to 1 percent slopes

Setting:

Havrelon soils occur on flats on floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Havrelon, moderately saline and similar soils: 35 to 65 percent

Average Component Composition
Havrelon, moderately saline: 42 percent
Trembles, moderately saline: 20 percent
Havrelon silty clay, slightly saline: 17 percent

Scorio: 12 percent
Havrelon, strongly saline: 7 percent
Lohler: 2 percent

Named Component Description

Havrelon
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Not affected
Typical profile:
A—0 to 13 inches; silty clay loam
C—13 to 60 inches; stratified very fine sandy loam to silty clay loam

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, irrigated cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

199—Mckeen loam, ponded, 0 to 1 percent slopes

Setting:

Ponded Mckeen soils occur in oxbows on flood plains in river valleys.

Map Unit Composition (percent)

Named Components
Mckeen and similar soils: 70 to 90 percent

Average Component Composition
Mckeen: 78 percent
Mckeen, fine sandy loam: 15 percent
Lallie: 7 percent

Named Component Description

Mckeen
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted

Drainage Class: Very poorly drained
Flooding: Frequent
Water Table: Seasonal
Ponding: Frequent
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; loam
C—2 to 12 inches; loam
Ab—12 to 15 inches; silty clay
2Cg—15 to 60 inches; stratified loamy fine sand to silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wetland wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

201F—Badland, outcrop-Cabbart complex, 6 to 70 percent slopes

Setting:

Badland occurs on barren shoulders and backslopes. Cabbart soils occur on summits and shoulders. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components
Badland, outcrop and similar soils: 50 to 80 percent
Cabbart and similar soils: 15 to 40 percent

Average Component Composition
Badland, outcrop: 63 percent
Cabbart: 30 percent
Arikara: 3 percent
Boxwell: 2 percent
Patent: 1 percent
Rock outcrop: 1 percent

Named Component Description

Badland, outcrop
Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None

Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Cabbart
Slope: 6 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 18 inches; loam
Cr—18 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

202D—Boxwell-Scairt-Maltese complex, 6 to 15 percent slopes

Setting:

Boxwell soils occur on backslopes. Scairt soils occur in micro-lows on backslopes. Maltese soils occur on micro-highs on footslopes. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components
Boxwell and similar soils: 20 to 40 percent
Scairt and similar soils: 10 to 30 percent
Maltese and similar soils: 10 to 30 percent

Average Component Composition
Boxwell: 27 percent
Scairt: 18 percent

Maltese: 14 percent
Kremlin: 10 percent
Burgraff: 9 percent
Ethridge: 7 percent
Lonna: 6 percent
Cabbart: 5 percent
Yawdim: 4 percent

Named Component Description

Boxwell

Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 28 inches; loam
Cr—28 to 60 inches; bedrock

Scairt

Slope: 6 to 15 percent
Depth to Restrictive Feature: Natric; top depth ranges from 1 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 6 inches; silty clay
Btnz—6 to 13 inches; silty clay loam
Bkz—13 to 22 inches; silty clay loam
BCy—22 to 28 inches; silty clay loam
Cr—28 to 60 inches; bedrock

Maltese

Slope: 6 to 15 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 15 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 7 inches; silt loam

E—7 to 10 inches; silt loam
Btn—10 to 16 inches; silty clay
Btkn—16 to 20 inches; silty clay
Btkny—20 to 33 inches; silty clay loam
BCy—33 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

203D—Rhame-Kremlin-Maltese complex, 1 to 15 percent slopes

Setting:

Rhame soils occur on backslopes. Kremlin and Maltese soils occur on footslopes. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components
Rhame and similar soils: 15 to 40 percent
Kremlin and similar soils: 10 to 30 percent
Maltese and similar soils: 10 to 30 percent

Average Component Composition
Rhame: 23 percent
Chinook: 18 percent
Kremlin: 16 percent
Maltese: 15 percent
Blacksheep: 7 percent
Boxwell: 6 percent
Ethridge: 6 percent
Tusler: 5 percent
Scairt: 3 percent
Heil: 1 percent

Named Component Description

Rhame
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None

Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; fine sandy loam
B—8 to 26 inches; fine sandy loam
C—26 to 34 inches; fine sandy loam
Cr—34 to 60 inches; bedrock

Kremlin
Slope: 1 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 11 inches; loam
Bw—11 to 19 inches; loam
Bk—19 to 60 inches; loam

Maltese
Slope: 1 to 9 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 15 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 7 inches; silt loam
E—7 to 10 inches; silt loam
Btn—10 to 16 inches; silty clay
Btkn—16 to 20 inches; silty clay
Btkny—20 to 33 inches; silty clay loam
BCy—33 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

203F—Rhame-Scairt-Kremlin complex, 15 to 35 percent slopes

Setting:

Rhame soils occur on backslopes. Scairt soils occur in micro-lows on side slopes. Kremlin soils occur on footslopes. This map unit occurs on hills and ridges in badlands.

Map Unit Composition (percent)

Named Components

Rhame and similar soils: 25 to 60 percent
Scairt and similar soils: 15 to 45 percent
Kremlin and similar soils: 5 to 30 percent

Average Component Composition

Rhame: 40 percent
Scairt: 22 percent
Kremlin: 13 percent
Maltese: 13 percent
Kirby: 4 percent
Cabbart: 3 percent
Fleak: 3 percent
Badland, outcrop: 2 percent

Named Component Description

Rhame

Slope: 15 to 35 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; fine sandy loam
B—8 to 26 inches; fine sandy loam
C—26 to 34 inches; fine sandy loam
Cr—34 to 60 inches; bedrock

Scairt

Slope: 15 to 25 percent
Depth to Restrictive Feature: Natric; top depth ranges from 1 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches

Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 6 inches; silty clay
Btnz—6 to 13 inches; silty clay loam
Bkz—13 to 22 inches; silty clay loam
BCy—22 to 28 inches; silty clay loam
Cr—28 to 60 inches; bedrock

Kremlin
Slope: 15 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 11 inches; loam
Bw—11 to 19 inches; loam
Bk—19 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

205—Havre silt loam, 0 to 3 percent slopes, rarely flooded

Setting:

Havre soils occur on flood plains in badlands.

Map Unit Composition (percent)

Named Components
Havre, rarely flooded and similar soils: 75 to 100 percent

Average Component Composition
Havre, rarely flooded: 89 percent
Channel: 5 percent
Glendive: 4 percent
Patent: 2 percent

Named Component Description

Havre, rarely flooded
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Rare
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 10 inches; silt loam
C—10 to 60 inches; stratified fine sandy loam to clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

206—Glendive fine sandy loam, 0 to 3 percent slopes, rarely flooded

Setting:

Glendive soils occur on flood plains in badlands.

Map Unit Composition (percent)

Named Components
Glendive, rarely flooded and similar soils: 60 to 95 percent

Average Component Composition
Glendive, rarely flooded: 84 percent
Channel: 5 percent
Hanly: 5 percent
Havre: 4 percent
Patent: 2 percent

Named Component Description

Glendive, rarely flooded
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained

Flooding: Rare
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; fine sandy loam
C1—5 to 16 inches; loam
C2—16 to 60 inches; stratified loamy fine sand to silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

207—Harriet silt loam, low precipitation, 0 to 3 percent slopes

Setting:

Harriet soils occur on alluvial flats and drainageways in badlands.

Map Unit Composition (percent)

Named Components
Harriet and similar soils: 80 to 100 percent

Average Component Composition
Harriet: 85 percent
Slickspots: 10 percent
Gerda: 5 percent

Named Component Description

Harriet
Slope: 0 to 3 percent
Depth to Restrictive Feature: Natric; top depth ranges from 0 to 5 inches
Drainage Class: Poorly drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 18 inches; clay loam

Bz1—18 to 28 inches; loam
2Bz2—28 to 38 inches; very fine sandy loam
3Ab—38 to 40 inches; clay loam
3C—40 to 60 inches; stratified very fine sandy loam to silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

211F—Cabba-Badland, outcrop-Arikara complex, 9 to 70 percent slopes

Setting:

Cabba soils occur on shoulders and summits. Badland, outcrop occurs on shoulders and backslopes. Arikara soils occur on footslopes and backslopes. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components
Cabba and similar soils: 20 to 55 percent
Badland, outcrop and similar soils: 20 to 55 percent
Arikara and similar soils: 15 to 45 percent

Average Component Composition
Cabba: 40 percent
Badland, outcrop: 34 percent
Arikara: 24 percent
Lambert: 2 percent

Named Component Description

Cabba
Slope: 9 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loam

Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Badland, outcrop
Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Arikara
Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

212—Trembles fine sandy loam, slightly wet, 0 to 2 percent slopes

Setting:

Trembles soils occur on flats of floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Trembles, slightly wet and similar soils: 60 to 85 percent

Average Component Composition
Trembles, slightly wet: 70 percent
Havrelon, slightly wet: 14 percent
Trembles loam, slightly wet: 10 percent
Banks: 3 percent
Ridgelawn, slightly wet: 3 percent

Named Component Description

Trembles
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 9 inches; fine sandy loam
C—9 to 59 inches; stratified fine sandy loam to silt loam
2C—59 to 80 inches; stratified sand to silt loam

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland or irrigated cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

213—Havrelon silt loam, slightly wet, 0 to 2 percent slopes

Setting:

Havrelon soils occur on linear flood plains in river valleys.

Map Unit Composition (percent)

Named Components
Havrelon, slightly wet and similar soils: 85 to 95 percent

Average Component Composition
Havrelon, slightly wet: 92 percent
Havrelon silty clay loam, slightly wet: 5 percent
Lallie: 1 percent
Lohler, slightly wet: 1 percent
Trembles, slightly wet: 1 percent

Named Component Description

Havrelon, slightly wet
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 13 inches; silt loam
C—13 to 60 inches; stratified very fine sandy loam to silty clay loam

Mapunit Notes: The seasonal water table is associated with flood irrigation and may not be present if areas are not inundated with water.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland and irrigated cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

214—Korchea loam, channeled, wooded, 0 to 2 percent slopes

Setting:

Korchea soils occur on flats of floodplains in river valleys on uplands.

Map Unit Composition (percent)

Named Components
Korchea, wooded and similar soils: 30 to 85 percent

Average Component Composition
Korchea, wooded: 52 percent
Channel: 40 percent
Velva: 8 percent

Named Component Description

Korchea, wooded
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Frequent
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 6 inches; stratified loam to silty clay loam
C—6 to 60 inches; stratified fine sandy loam to silty clay loam

Mapunit Notes: Some areas have intermixed stands of conifers and hardwoods that may affect wildlife, range, and other interpretations. These stands may be dependent on landscape position, slope, or aspect.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, range or wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

217—Wolf Point silty clay loam, wooded, 0 to 1 percent slopes

Setting:

Wolf Point soils occur on wooded floodplains in river valleys.

Map Unit Composition (percent)

Named Components
Wolf Point, wooded and similar soils: 55 to 95 percent

Average Component Composition
Wolf Point, wooded: 78 percent
Havre: 11 percent
Channel: 5 percent
Glendive: 4 percent
Ethridge: 2 percent

Named Component Description

Wolf Point, wooded
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A1—0 to 1 inches; silty clay loam
A2—1 to 10 inches; clay
C—10 to 60 inches; silty clay

Mapunit Notes: Some areas have intermixed stands of conifers and hardwoods that may affect wildlife, range, and other interpretations. These stands may be dependent on landscape position, slope, or aspect.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

218F—Cherry-Cabba-Brandenburg complex, 9 to 35 percent slopes

Setting:

Cherry soils occur on footslopes and toeslopes of fans. Cabba soils occur on shoulders. Brandenburg soils occur on summits and shoulders. This map unit occurs on ridges and hills on uplands.

Map Unit Composition (percent)

Named Components
Cherry, and similar soils: 15 to 45 percent
Cabba and similar soils: 15 to 40 percent
Brandenburg and similar soils: 5 to 30 percent

Average Component Composition
Cherry: 23 percent
Cabba: 22 percent
Brandenburg: 16 percent
Chama: 10 percent
Maschetah: 9 percent

Cherry, moderately steep: 7 percent
Cohagen: 4 percent
Havrelon: 4 percent
Lambert: 3 percent
Janesburg: 2 percent

Named Component Description

Cherry

Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bw—3 to 33 inches; silt loam
C—33 to 60 inches; silty clay loam

Cabba

Slope: 9 to 35 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Brandenburg

Slope: 9 to 35 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 10 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; channery loam
C1—4 to 10 inches; very channery loam
C2—10 to 60 inches; channers

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

227—Haydraw silt loam, 0 to 3 percent slopes

Setting:

Haydraw soils occur on alluvial flats in badlands.

Map Unit Composition (percent)

Named Components
Haydraw and similar soils: 70 to 90 percent

Average Component Composition
Haydraw: 84 percent
Floweree: 6 percent
Lonna: 6 percent
Glendive: 4 percent

Named Component Description

Haydraw
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bk—6 to 58 inches; silt loam
C—58 to 80 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

227B—Haydraw silt loam, 3 to 6 percent slopes

Setting:

Haydraw soils occur on footslopes and backslopes of alluvial fans in badlands.

Map Unit Composition (percent)

Named Components
Haydraw and similar soils: 60 to 85 percent

Average Component Composition
Haydraw: 72 percent
Floweree: 13 percent
Ethridge: 10 percent
Boxwell: 5 percent

Named Component Description

Haydraw
Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; silt loam
Bk—6 to 58 inches; silt loam
C—58 to 80 inches; silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, hayland, or pasture

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

231C—Patent-Gullied land-Glendive complex, 1 to 9 percent slopes

Setting:

Patent soils occur on linear footslopes on alluvial fans. Gullied land occurs as v-shaped channels on dissected alluvial fans. Glendive soils occur on floodplains. This map unit occurs in badlands.

Map Unit Composition (percent)

Named Components

Patent and similar soils: 20 to 45 percent
Gullied land and similar soils: 10 to 30 percent
Glendive and similar soils: 10 to 30 percent

Average Component Composition

Patent: 32 percent
Gullied land: 19 percent
Glendive: 13 percent
Lonna: 12 percent
Hanly: 8 percent
Kremlin: 5 percent
Havre: 4 percent
Gerda: 3 percent
Ethridge: 2 percent
Sham: 2 percent

Named Component Description

Patent

Slope: 1 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
AC—0 to 7 inches; loam
C—7 to 60 inches; stratified fine sandy loam to silty clay loam

Gullied land

Slope: 9 to 99 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches

Glendive

Slope: 1 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
Ap—0 to 5 inches; fine sandy loam
C1—5 to 16 inches; loam
C2—16 to 60 inches; stratified loamy fine sand to silt loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

232C—Lambert-Slickspots-Rhoades complex, 1 to 9 percent slopes

Setting:

Lambert soils occur on alluvial fans. Slickspots occur on barren alluvial fans and alluvial flats. Rhoades soils occur in micro-lows on alluvial fans and alluvial flats. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components
Lambert and similar soils: 25 to 60 percent
Slickspots and similar soils: 10 to 40 percent
Rhoades and similar soils: 10 to 40 percent

Average Component Composition
Lambert: 41 percent
Slickspots: 21 percent
Rhoades: 15 percent
Daglum: 10 percent
Korell: 7 percent
Rhoades, gently sloping: 6 percent

Named Component Description

Lambert
Slope: 0 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 5 inches; silt loam
C1—5 to 36 inches; silt loam
C2—36 to 60 inches; very fine sandy loam

Slickspots
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 1 inches; silty clay
H2—1 to 60 inches; stratified loam to silty clay

Rhoades
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 1 to 5 inches
Drainage Class: Well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 3 inches; silt loam
Btn—3 to 8 inches; silty clay
Btknyz—8 to 14 inches; silty clay
Bky—14 to 46 inches; silty clay
C—46 to 60 inches; silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

238B—Janesburg-Dogtooth silt loams, 0 to 6 percent slopes

Setting:

Janesburg soils occur on micro-highs. Dogtooth soils occur in micro-lows. This map unit occurs on pediments on uplands.

Map Unit Composition (percent)

Named Components

Janesburg and similar soils: 35 to 50 percent
Dogtooth and similar soils: 20 to 40 percent

Average Component Composition

Janesburg: 40 percent
Dogtooth: 29 percent
Belfield: 10 percent
Regent: 8 percent
Janesburg, fine sandy loam: 5 percent
Moreau: 4 percent
Farland: 3 percent
Slickspots: 1 percent

Named Component Description

Janesburg

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; silt loam
E—8 to 10 inches; silt loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Dogtooth

Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 4 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 2 inches; silt loam
Btn—2 to 8 inches; silty clay
Btkn—8 to 13 inches; silty clay
Bky—13 to 21 inches; silty clay
Cr—21 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, hayland or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

239D—Vebar-Janesburg fine sandy loams, 3 to 15 percent slopes

Setting:

Vebar soils occur on backslopes. Janesburg soils occur on backslopes and footslopes. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Vebar and similar soils: 20 to 55 percent
Janesburg and similar soils: 5 to 35 percent

Average Component Composition

Vebar: 30 percent
Janesburg: 19 percent
Tally: 11 percent
Parshall: 10 percent
Beisigl: 8 percent
Cohagen: 6 percent
Shambo: 6 percent
Dogtooth: 5 percent
Telfer: 3 percent
Sen: 2 percent

Named Component Description

Vebar

Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; fine sandy loam
Bw—5 to 26 inches; fine sandy loam
BCk—26 to 32 inches; fine sandy loam
Cr—32 to 60 inches; bedrock

Janesburg

Slope: 3 to 15 percent
Depth to Restrictive Feature: Natric; top depth ranges from 2 to 13 inches; Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 8 inches; fine sandy loam
E—8 to 10 inches; fine sandy loam
Btn—10 to 21 inches; silty clay
BCk—21 to 26 inches; silt loam
Cr—26 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

242F—Zahl-Williams-Arikara loams, 9 to 45 percent slopes

Setting:

Zahl soils occur on shoulders. Williams soils occur on summits and backslopes. Arikara soils occur on backslopes and footslopes. This map unit occurs on dissected knolls and ridges on till plains and moraines.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 40 to 65 percent
Williams and similar soils: 15 to 30 percent
Arikara and similar soils: 10 to 25 percent

Average Component Composition

Zahl: 50 percent
Williams: 20 percent
Arikara: 15 percent
Williams, strongly sloping: 7 percent
Bowbells: 4 percent

Rhoades: 2 percent
Wabek: 2 percent

Named Component Description

Zahl
Slope: 9 to 45 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Williams
Slope: 15 to 35 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Arikara
Slope: 15 to 45 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

287F—Arikara-Cabba loams, 15 to 70 percent slopes

Setting:

Arikara soils occur on backslopes and footslopes. Cabba soils occur on shoulders. This map unit occurs on ridges on uplands.

Map Unit Composition (percent)

Named Components

Arikara and similar soils: 50 to 85 percent
Cabba and similar soils: 10 to 45 percent

Average Component Composition

Arikara: 70 percent
Cabba: 26 percent
Korchea: 2 percent
Lambert: 2 percent

Named Component Description

Arikara

Slope: 15 to 70 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Cabba

Slope: 15 to 70 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 3 inches; loam
Bk—3 to 15 inches; loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

299—Minnewaukan-Banks-Riverwash complex, 0 to 3 percent slopes

Setting:

Minnewaukan soils occur on flats and in depressions. Banks soils occur on flats and levees. Riverwash occurs on point bars and channels. This map unit occurs on floodplains in river valleys on uplands.

Map Unit Composition (percent)

Named Components
Minnewaukan and similar soils: 20 to 60 percent
Banks and similar soils: 15 to 45 percent
Riverwash and similar soils: 15 to 45 percent

Average Component Composition
Minnewaukan: 40 percent
Banks: 30 percent
Riverwash: 30 percent

Named Component Description

Minnewaukan
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Poorly drained
Flooding: Frequent
Water Table: Seasonal
Ponding: Frequent
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; fine sandy loam
AC—3 to 5 inches; loamy coarse sand
Cg—5 to 60 inches; stratified fine sand to loamy sand

Banks

Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Somewhat excessively drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; loamy fine sand
C1—4 to 30 inches; fine sand
C2—30 to 60 inches; loamy fine sand

Riverwash

Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Somewhat poorly drained
Flooding: Frequent
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
H1—0 to 6 inches; gravelly sand
H2—6 to 60 inches; stratified gravelly coarse sand to gravelly sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

317—Lallie silty clay, 0 to 1 percent slopes

Setting:

Lallie soils occur on flats of floodplains in river valleys in badlands.

Map Unit Composition (percent)

Named Components

Lallie and similar soils: 80 to 100 percent

Average Component Composition

Lallie: 85 percent
Havre, frequently flooded: 15 percent

Named Component Description

Lallie
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Poorly drained
Flooding: Occasional
Water Table: Seasonal
Ponding: Rare
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; silty clay
Cg—2 to 24 inches; silty clay loam
Ab—24 to 32 inches; silty clay
C'g—32 to 60 inches; silty clay

Detailed soil descriptions for all map unit components are in alphabetical order in the section "Soil Series and Their Morphology." Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Pasture, hayland, or range and wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

331B—Cherry-Gullied land-Havrelon complex, 0 to 6 percent slopes

Setting:

Cherry soils occur on linear alluvial fans. Gullied land occurs on dissected alluvial fans and v-shaped channels. Havrelon soils occur on linear floodplains. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components
Cherry and similar soils: 20 to 60 percent
Gullied land and similar soils: 10 to 40 percent
Havrelon and similar soils: 5 to 35 percent

Average Component Composition
Cherry: 33 percent
Gullied land: 21 percent
Havrelon: 16 percent
Maschetah: 11 percent
Golva: 5 percent
Havrelon, frequently flooded: 4 percent
Lallie: 4 percent
Cabba: 2 percent

Channel: 2 percent
Velva: 2 percent

Named Component Description

Cherry
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bw—3 to 33 inches; silt loam
C—33 to 60 inches; silty clay loam

Gullied land
Slope: 9 to 99 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 40 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches

Havrelon
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 13 inches; silt loam
C—13 to 60 inches; stratified very fine sandy loam to silty clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

340B—Niobell-Williams loams, 0 to 6 percent slopes

Setting:

Niobell soils occur in swales. Williams soils occur on rises. This map unit occurs on till plains.

Map Unit Composition (percent)

Named Components

Niobell and similar soils: 30 to 60 percent
Williams and similar soils: 15 to 40 percent

Average Component Composition

Niobell: 42 percent
Williams: 27 percent
Noonan: 11 percent
Arnegard: 10 percent
Bowbells: 7 percent
Dooley: 1 percent
Lehr: 1 percent
Tonka: 1 percent

Named Component Description

Niobell

Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Sodic within 30 inches
Typical profile:
Ap—0 to 6 inches; loam
B/E—6 to 9 inches; loam
Btn—9 to 19 inches; clay loam
Bky—19 to 29 inches; clay loam
C—29 to 60 inches; loam

Williams

Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam

Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

341B—Noonan-Niobell-Williams loams, 0 to 6 percent slopes

Setting:

Noonan soils occur in micro-lows on rises. Niobell and Williams soils occur on rises. This map unit occurs on till plains.

Map Unit Composition (percent)

Named Components
Noonan and similar soils: 30 to 65 percent
Niobell and similar soils: 15 to 45 percent
Williams and similar soils: 10 to 40 percent

Average Component Composition
Noonan: 39 percent
Niobell: 31 percent
Williams: 23 percent
Zahl: 3 percent
Miranda: 2 percent
Cabba: 1 percent
Reeder: 1 percent

Named Component Description

Noonan
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric; top depth ranges from 5 to 10 inches
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches

Typical profile:
Ap—0 to 6 inches; loam
Btn1—6 to 9 inches; clay loam
Btn2—9 to 12 inches; clay loam
Bky1—12 to 20 inches; clay loam
Bky2—20 to 28 inches; loam
BCy—28 to 60 inches; loam

Niobell
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Moderately well drained
Flooding: None
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Sodic within 30 inches
Typical profile:
Ap—0 to 6 inches; loam
B/E—6 to 9 inches; loam
Btn—9 to 19 inches; clay loam
Bky—19 to 29 inches; clay loam
C—29 to 60 inches; loam

Williams
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

341C—Noonan-Williams loams, 6 to 9 percent slopes

Setting:

Noonan soils occur in micro-lows on summits and backslopes. Williams soils occur on summits and backslopes. This map unit occurs on knolls and ridges on till plains.

Map Unit Composition (percent)

Named Components

Noonan and similar soils: 20 to 55 percent
Williams and similar soils: 15 to 45 percent

Average Component Composition

Noonan: 23 percent
Williams: 22 percent
Niobell: 17 percent
Williams, gently sloping: 13 percent
Janesburg: 6 percent
Reeder: 6 percent
Dooley: 5 percent
Miranda: 3 percent
Zahl: 3 percent
Wabek: 2 percent

Named Component Description

Noonan

Slope: 6 to 9 percent
Depth to Restrictive Feature: Natric; top depth ranges from 5 to 10 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
Ap—0 to 6 inches; loam
Btn1—6 to 9 inches; clay loam
Btn2—9 to 12 inches; clay loam
Bky1—12 to 20 inches; clay loam
Bky2—20 to 28 inches; loam
BCy—28 to 60 inches; loam

Williams

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam

Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

403F—Rhame-Arikara-Fleak complex, 9 to 50 percent slopes

Setting:

Rhame soils occur on backslopes. Arikara soils occur on wooded footslopes. Fleak soils occur on shoulders. This map unit occurs on ridges in badlands.

Map Unit Composition (percent)

Named Components
Rhame and similar soils: 15 to 45 percent
Arikara and similar soils: 15 to 45 percent
Fleak and similar soils: 5 to 30 percent

Average Component Composition
Rhame: 24 percent
Arikara: 23 percent
Fleak: 16 percent
Tusler: 13 percent
Chinook: 6 percent
Kremlin: 5 percent
Rhame, strongly sloping: 5 percent
Blacksheep: 4 percent
Maltese: 4 percent

Named Component Description

Rhame
Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Well drained
Flooding: None

Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 8 inches; fine sandy loam
B—8 to 26 inches; fine sandy loam
C—26 to 34 inches; fine sandy loam
Cr—34 to 60 inches; bedrock

Arikara
Slope: 15 to 50 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Oi—0 to 1 inches; slightly decomposed plant material
A—1 to 2 inches; loam
Bw—2 to 14 inches; loam
Bk—14 to 39 inches; loam
C—39 to 60 inches; loam

Fleak
Slope: 15 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 7 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; loamy fine sand
C—3 to 17 inches; loamy fine sand
Cr—17 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

404F—Badland, outcrop-Lambert-Cabba complex, 6 to 50 percent slopes

Setting:

Badland occurs on barren backslopes and shoulders on ridges. Lambert soils occur on alluvial fans. Cabba soils occur on shoulders and summits of ridges. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components

Badland, outcrop and similar soils: 30 to 55 percent
Lambert and similar soils: 20 to 45 percent
Cabba and similar soils: 5 to 25 percent

Average Component Composition

Badland, outcrop: 42 percent
Lambert: 34 percent
Cabba: 12 percent
Daglum: 4 percent
Rhoades: 3 percent
Arikara: 2 percent
Vebar: 2 percent
Havrelon: 1 percent

Named Component Description

Badland, outcrop

Slope: 9 to 150 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 0 to 5 inches
Drainage Class: —
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
H1—0 to 60 inches; bedrock

Lambert

Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; silt loam
C1—5 to 36 inches; silt loam
C2—36 to 60 inches; very fine sandy loam

Cabba

Slope: 9 to 50 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

406—Glendive fine sandy loam, wooded, 0 to 3 percent slopes

Setting:

Glendive soils occur on wooded flood plains in river valleys.

Map Unit Composition (percent)

Named Components

Glendive, wooded and similar soils: 70 to 95 percent

Average Component Composition

Glendive, wooded: 74 percent
Glendive: 9 percent
Hanly: 8 percent
Channel: 5 percent
Havre: 4 percent

Named Component Description

Glendive, wooded

Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: Seasonal

Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 5 inches; fine sandy loam
C1—5 to 16 inches; loam
C2—16 to 60 inches; stratified loamy fine sand to silt loam

Mapunit Notes: Some areas have intermixed stands of conifers and hardwoods that may affect wildlife, range, and other interpretations. These stands may be dependent on landscape position, slope, or aspect.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

408B—Hanly fine sandy loam, wooded, 0 to 6 percent slopes

Setting:

Hanly soils occur on wooded flood plains in river valleys.

Map Unit Composition (percent)

Named Components
Hanly, wooded and similar soils: 55 to 90 percent

Average Component Composition
Hanly, wooded: 61 percent
Hanly: 20 percent
Glendive: 17 percent
Minnewaukan: 1 percent
Riverwash: 1 percent

Named Component Description

Hanly, wooded
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Somewhat excessively drained
Flooding: Occasional
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
A—0 to 5 inches; fine sandy loam
C—5 to 60 inches; stratified sand to fine sandy loam

Mapunit Notes: Some areas have intermixed stands of conifers and hardwoods that may affect wildlife, range, and other interpretations. These stands may be dependent on landscape position, slope, or aspect.

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

410—Riverwash

Setting:

Riverwash occurs on point bars and channels of floodplains in river valleys on uplands.

Map Unit Composition (percent)

Named Components
Riverwash and similar soils: 50 to 95 percent

Average Component Composition
Riverwash: 85 percent
Banks: 10 percent
Minnewaukan: 5 percent

Named Component Description

Riverwash
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Poorly drained
Flooding: Frequent
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
H1—0 to 6 inches; gravelly sand
H2—6 to 60 inches; stratified gravelly coarse sand to gravelly sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this

map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

411B—Lambert silt loam, 0 to 6 percent slopes

Setting:

Lambert soils occur on linear alluvial flats and fans on uplands.

Map Unit Composition (percent)

Named Components
Lambert and similar soils: 65 to 95 percent

Average Component Composition
Lambert: 81 percent
Maschetah: 10 percent
Cherry: 9 percent

Named Component Description

Lambert
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: Occasional
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; silt loam
C1—5 to 36 inches; silt loam
C2—36 to 60 inches; very fine sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section "Soil Series and Their Morphology." Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the "Soil Properties" section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the "Potential Cropland Limitations and Hazards" table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

412E—Lambert-Brandenburg complex, 3 to 25 percent slopes

Setting:

Lambert soils occur on linear alluvial fans. Brandenburg soils occur on summits and shoulders of ridges. This map unit occurs on uplands.

Map Unit Composition (percent)

Named Components

Lambert and similar soils: 20 to 55 percent
Brandenburg and similar soils: 15 to 45 percent

Average Component Composition

Lambert: 37 percent
Brandenburg: 26 percent
Searing: 14 percent
Daglum: 7 percent
Ringling: 7 percent
Rhoades: 4 percent
Cherry: 3 percent
Shambo: 2 percent

Named Component Description

Lambert

Slope: 3 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: Occasional
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; silt loam
C1—5 to 36 inches; silt loam
C2—36 to 60 inches; very fine sandy loam

Brandenburg

Slope: 6 to 25 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification; top depth ranges from 10 to 20 inches
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 4 inches; channery loam
C1—4 to 10 inches; very channery loam
C2—10 to 60 inches; channers

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

442F—Zahl-Williams loams, dissected, 15 to 45 percent slopes

Setting:

Zahl soils occur on summits and shoulders. Williams soils occur on backslopes and footslopes. This map unit occurs on ridges on till plains.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 40 to 65 percent
Williams and similar soils: 10 to 30 percent

Average Component Composition

Zahl: 50 percent
Williams: 24 percent
Shambo: 11 percent
Bowbells: 8 percent
Cabba: 2 percent
Rhoades: 2 percent
Wabek: 2 percent
Belfield: 1 percent

Named Component Description

Zahl

Slope: 15 to 45 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Williams

Slope: 15 to 25 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Range and wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

460C—Zahl-Williams-Cabba complex, 6 to 9 percent slopes

Setting:

Zahl soils occur on shoulders. Williams soils occur on summits. Cabba soils occur on shoulders and backslopes. This map unit occurs on knolls and ridges on till-mantled residual uplands.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 15 to 40 percent
Williams and similar soils: 10 to 35 percent
Cabba and similar soils: 10 to 30 percent

Average Component Composition

Zahl: 28 percent
Williams: 20 percent
Cabba: 19 percent
Chama: 10 percent
Farnuf: 7 percent
Reeder: 7 percent

Amor: 4 percent
Arnegard: 3 percent
Noonan: 2 percent

Named Component Description

Zahl
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Williams
Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Cabba
Slope: 6 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

460D—Zahl-Cabba-Williams complex, 9 to 15 percent slopes

Setting:

Zahl soils occur on summits and shoulders. Cabba soils occur on shoulders and backslopes. Williams soils occur on summits. This map unit occurs on knolls and ridges on till-mantled residual uplands.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 20 to 45 percent
Cabba and similar soils: 15 to 35 percent
Williams and similar soils: 10 to 30 percent

Average Component Composition

Zahl: 32 percent
Cabba: 24 percent
Williams: 13 percent
Chama: 7 percent
Farnuf: 7 percent
Reeder: 7 percent
Janesburg: 4 percent
Flasher: 2 percent
Savage: 2 percent
Vebar: 2 percent

Named Component Description

Zahl

Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Cabba

Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 10 to 20 inches
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 3 inches; silt loam
Bk—3 to 15 inches; silt loam
Cr—15 to 60 inches; bedrock

Williams

Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

470C—Zahl-Tally-Williams complex, 6 to 9 percent slopes

Setting:

Zahl soils occur on summits and shoulders. Tally soils occur on footslopes. Williams soils occur on summits. This map unit occurs on knolls and ridges on till-mantled residual uplands.

Map Unit Composition (percent)

Named Components

Zahl and similar soils: 20 to 50 percent
Tally and similar soils: 10 to 35 percent
Williams and similar soils: 10 to 30 percent

Average Component Composition

Zahl: 31 percent
Tally: 18 percent
Williams: 16 percent
Beisigl: 11 percent
Vebar: 11 percent
Cohagen: 5 percent
Arnegard: 4 percent
Dooley: 4 percent

Named Component Description

Zahl

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Tally

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bw—6 to 32 inches; fine sandy loam
Bk—32 to 60 inches; fine sandy loam

Williams

Slope: 6 to 9 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected

Typical profile:
Ap—0 to 6 inches; loam
Bt1—6 to 10 inches; clay loam
Bt2—10 to 15 inches; clay loam
Btk—15 to 24 inches; clay loam
Bk—24 to 36 inches; clay loam
C—36 to 60 inches; clay loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Cropland, pasture, or hayland

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

470D—Zahl-Beisigl-Tally complex, 9 to 15 percent slopes

Setting:

Zahl soils occur on summits and shoulders. Beisigl soils occur on shoulders and backslopes. Tally soils occur on footslopes. This map unit occurs on knolls and ridges on till-mantled residual uplands.

Map Unit Composition (percent)

Named Components
Zahl and similar soils: 20 to 45 percent
Beisigl and similar soils: 15 to 40 percent
Tally and similar soils: 10 to 25 percent

Average Component Composition
Zahl: 31 percent
Beisigl: 27 percent
Tally: 15 percent
Williams: 9 percent
Dooley: 7 percent
Vebar: 6 percent
Reeder: 2 percent
Telfer: 2 percent
Janesburg: 1 percent

Named Component Description

Zahl
Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None

Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 20 inches; loam
C—20 to 60 inches; clay loam

Beisigl
Slope: 9 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches
Drainage Class: Somewhat excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
A—0 to 5 inches; loamy fine sand
Bk—5 to 27 inches; loamy fine sand
Cr—27 to 60 inches; bedrock

Tally
Slope: 9 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
Ap—0 to 6 inches; fine sandy loam
Bw—6 to 32 inches; fine sandy loam
Bk—32 to 60 inches; fine sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Pasture, hayland, or range

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

490—Riverwash, low precipitation

Setting:

Riverwash occurs on point bars of flood plains in river valleys.

Map Unit Composition (percent)

Named Components
Riverwash and similar soils: 50 to 95 percent

Average Component Composition
Riverwash: 85 percent
Hanly: 10 percent
Minnewaukan: 5 percent

Named Component Description

Riverwash
Slope: 0 to 1 percent
Depth to Restrictive Feature: None noted
Drainage Class: Poorly drained
Flooding: Frequent
Water Table: Seasonal
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
H1—0 to 6 inches; gravelly sand
H2—6 to 60 inches; stratified coarse sand to sandy loam

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

496—Pits, gravel and sand, low precipitation

Setting:

Pits, gravel and sand, low precipitation occurs on paleoterraces in badlands.

Map Unit Composition (percent)

Named Components
Pits, gravel and sand, low precipitation and similar soils: 85 to 100 percent

Average Component Composition
Pits, gravel and sand, low precipitation: 90 percent
Chanta: 5 percent
Tinsley: 5 percent

Named Component Description

Pits, gravel and sand, low precipitation
Slope: 0 to 60 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Flooding: None
Water Table: None
Ponding: None
Salt Affected: Not affected
Sodium Affected: Not affected
Typical profile:
H1—0 to 6 inches; extremely gravelly sand
H2—6 to 60 inches; extremely gravelly sand

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Wildlife habitat

For cropland limitations and hazards see the “Potential Cropland Limitations and Hazards” table. For information about managing this map unit, see the following sections: Agronomy, Rangeland, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

M-W—Miscellaneous water

Setting:

These are generally small areas of waste water such as sewage lagoons.

Map Unit Composition (percent)

Named Components
Miscellaneous water and similar soils: 100 percent

Average Component Composition
Miscellaneous water: 100 percent

Named Component Description

Miscellaneous water
Slope: —
Depth to Restrictive Feature: None noted
Drainage Class: —
Flooding: None
Water Table: Seasonal
Ponding: Frequent
Salt Affected: Not affected
Sodium Affected: Not affected

Detailed soil descriptions for all map unit components are in alphabetical order in the section “Soil Series and Their Morphology.” Additional information specific to this map unit, such as USDA textures, permeability, and soil reaction, is available in the “Soil Properties” section.

Management

Major uses: Waste water storage

W—Water

Setting:

These are natural and man made fresh water bodies, generally along streams and in depressions.

Map Unit Composition (percent)

Named Components
Water and similar soils: 100 percent

Average Component Composition
Water: 100 percent

Named Component Description

Definition: Areas, including ponds, lakes, streams, and reservoirs, that are covered with water in most years during the period that is warm enough for plants to grow or longer.

Management

Major uses: Wetland wildlife habitat.

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
2	Heil silty clay, 0 to 1 percent slopes	1,581	*
3	Dimmick silty clay loam, 0 to 1 percent slopes	830	*
5	Tonka-Hamerly complex, 0 to 3 percent slopes	696	*
7	Harriet silt loam, 0 to 2 percent slopes	8,870	0.5
9	Grano silty clay, 0 to 1 percent slopes	1,620	*
10	Banks fine sandy loam, slightly wet, 0 to 1 percent slopes	1,077	*
10D	Seroco-Lohler complex, 0 to 15 percent slopes	118	*
11B	Patent loam, 1 to 6 percent slopes	3,211	0.2
12	Trembles fine sandy loam, 0 to 2 percent slopes	1,133	*
13	Havrelon silt loam, 0 to 2 percent slopes	2,200	0.1
14	Korchea loam, channeled, 0 to 2 percent slopes	14,859	0.8
15	Korchea loam, 0 to 2 percent slopes	13,323	0.7
16	Ridgelawn silt loam, slightly wet, 0 to 2 percent slopes	1,894	0.1
17	Lohler silty clay, slightly wet, 0 to 2 percent slopes	8,676	0.5
19	Hoffmanville silty clay, slightly wet, 0 to 2 percent slopes	1,607	*
20	Scorio silty clay, slightly wet, 0 to 2 percent slopes	4,001	0.2
21B	Tally-Parshall fine sandy loams, 0 to 6 percent slopes	10,946	0.6
21C	Tally-Parshall fine sandy loams, 6 to 9 percent slopes	1,930	0.1
22	Velva fine sandy loam, 0 to 2 percent slopes	2,668	0.1
23B	Lihen-Parshall complex, 0 to 6 percent slopes	1,422	*
23D	Beisigl-Telfer loamy fine sands, 6 to 15 percent slopes	3,622	0.2
24	Arnegard loam, 0 to 2 percent slopes	1,761	*
25	Farnuf loam, 0 to 2 percent slopes	12,843	0.7
25B	Farnuf loam, 2 to 6 percent slopes	20,010	1.1
25C	Farnuf loam, 6 to 9 percent slopes	8,092	0.4
26	Tansem-Roseglen silt loams, 0 to 3 percent slopes	2,229	0.1
26B	Tansem-Roseglen silt loams, 3 to 6 percent slopes	804	*
27	Golva silt loam, 0 to 2 percent slopes	1,791	*
27B	Golva silt loam, 2 to 6 percent slopes	3,019	0.2
27C	Golva silt loam, 6 to 9 percent slopes	956	*
29	Savage silty clay loam, 0 to 2 percent slopes	10,192	0.6
29B	Savage silty clay loam, 2 to 6 percent slopes	8,219	0.4
29C	Savage silty clay loam, 6 to 9 percent slopes	1,651	*
30	Lawther silty clay, 0 to 2 percent slopes	10,562	0.6
31B	Cherry silt loam, 0 to 6 percent slopes	2,790	0.2
31C	Cherry silt loam, 6 to 9 percent slopes	4,100	0.2
32F	Cherry-Cabba silt loams, 9 to 40 percent slopes	32,711	1.8
33	Belfield-Grail silty clay loams, 0 to 2 percent slopes	15,740	0.9
33B	Belfield-Savage silty clay loams, 2 to 6 percent slopes	14,010	0.8
34B	Daglum-Belfield complex, 0 to 6 percent slopes	40,479	2.2
36B	Rhoades-Daglum complex, 0 to 6 percent slopes	27,104	1.5
38B	Dogtooth-Janesburg silt loams, 0 to 6 percent slopes	18,374	1.0
38F	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	62,760	3.4
40B	Desart-Janesburg-Ekalaka complex, 0 to 6 percent slopes	482	*
41	Williams-Bowbells loams, 0 to 3 percent slopes	5,764	0.3
41B	Williams-Bowbells loams, 3 to 6 percent slopes	19,446	1.1
42B	Williams-Zahl loams, 3 to 6 percent slopes	51,230	2.8
42C	Williams loam, 6 to 9 percent slopes	4,575	0.2
43C	Williams-Zahl loams, 6 to 9 percent slopes	60,968	3.3
44D	Zahl-Williams loams, 9 to 15 percent slopes	38,679	2.1
44E	Zahl-Williams loams, 15 to 25 percent slopes	12,588	0.7
45F	Zahl-Cabba-Maschetah complex, 3 to 70 percent slopes	88,746	4.8
46B	Dooley-Zahl complex, 3 to 6 percent slopes	9,272	0.5
46C	Dooley-Zahl complex, 6 to 9 percent slopes	12,435	0.7
46D	Dooley-Zahl complex, 9 to 15 percent slopes	4,636	0.3
48	Temvik-Wilton silt loams, 0 to 3 percent slopes	6,582	0.4
49	Temvik-Williams silt loams, 0 to 3 percent slopes	3,052	0.2
49B	Temvik-Williams silt loams, 3 to 6 percent slopes	6,333	0.3
50B	Temvik-Zahl complex, 3 to 6 percent slopes	6,370	0.3
51B	Amor-Shambo loams, 3 to 6 percent slopes	1,645	*
51C	Amor-Cabba loams, 6 to 9 percent slopes	3,190	0.2
51D	Amor-Cabba loams, 9 to 15 percent slopes	2,545	0.1
52B	Reeder-Farnuf loams, 3 to 6 percent slopes	1,891	0.1

* See footnote at end of table

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
52C	Reeder-Cabba loams, 6 to 9 percent slopes	1,483	*
53B	Chama-Sen-Cabba silt loams, 3 to 6 percent slopes	5,197	0.3
53C	Chama-Cabba-Sen silt loams, 6 to 9 percent slopes	16,730	0.9
53D	Cabba-Chama-Sen silt loams, 9 to 15 percent slopes	35,503	1.9
54F	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	26,417	1.4
55B	Sen-Janesburg silt loams, 0 to 6 percent slopes	1,349	*
56B	Lefor fine sandy loam, 0 to 6 percent slopes	1,983	0.1
56C	Lefor fine sandy loam, 6 to 9 percent slopes	518	*
61D	Beisigl-Flasher loamy fine sands, 6 to 15 percent slopes	13,177	0.7
61F	Beisigl-Flasher-Tally complex, 9 to 50 percent slopes	38,345	2.1
62F	Flasher-Rock outcrop-Vebar complex, 9 to 70 percent slopes	5,176	0.3
63B	Vebar-Flasher complex, 3 to 6 percent slopes	7,541	0.4
63C	Vebar-Flasher complex, 6 to 9 percent slopes	13,144	0.7
63D	Vebar-Flasher-Tally complex, 9 to 15 percent slopes	20,412	1.1
66B	Manning fine sandy loam, 0 to 6 percent slopes	1,844	0.1
70B	Regent-Savage silty clay loams, 3 to 6 percent slopes	1,675	*
70C	Regent-Cabba complex, 6 to 9 percent slopes	928	*
71B	Regent-Janesburg complex, 0 to 6 percent slopes	2,282	0.1
71C	Regent-Janesburg complex, 6 to 9 percent slopes	2,001	0.1
72B	Moreau silty clay, 0 to 6 percent slopes	2,168	0.1
72C	Moreau-Wayden silty clays, 6 to 9 percent slopes	1,939	0.1
72D	Moreau-Cabba complex, 9 to 15 percent slopes	940	*
80	Badland, high precipitation	1,310	*
83F	Cabba-Badland, outcrop complex, 9 to 70 percent slopes	49,494	2.7
84F	Cabba-Chama-Havrelon silt loams, 3 to 70 percent slopes	27,864	1.5
88D	Brandenburg-Searing-Dogtooth complex, 6 to 15 percent slopes	8,732	0.5
88F	Brandenburg-Cabba-Dogtooth complex, 15 to 70 percent slopes	35,801	2.0
89F	Brandenburg-Cabba-Badland, outcrop complex, 9 to 70 percent slopes	22,948	1.3
90E	Manning-Schaller-Wabek complex, 6 to 25 percent slopes	4,357	0.2
91F	Wabek-Zahl complex, 9 to 35 percent slopes	3,837	0.2
93B	Lehr-Stady loams, 0 to 6 percent slopes	3,165	0.2
94B	Searing-Ringling loams, 0 to 6 percent slopes	317	*
95	Havrelon silty clay, slightly wet, 0 to 2 percent slopes	6,799	0.4
96	Pits, gravel and sand	367	*
98F	Tinsley-Chanta complex, 6 to 35 percent slopes	3,753	0.2
99	Mckeen loam, 0 to 1 percent slopes	8,577	0.5
100F	Boxwell-Cabbart-Arikara complex, 9 to 50 percent slopes	34,790	1.9
101F	Cabbart-Badland, outcrop complex, 6 to 70 percent slopes	29,516	1.6
102B	Kremlin-Ethridge-Gerda complex, 1 to 6 percent slopes	1,554	*
103B	Chinook-Rhame fine sandy loams, 1 to 6 percent slopes	1,339	*
103D	Rhame-Chinook fine sandy loams, 6 to 15 percent slopes	9,929	0.5
103F	Rhame-Fleak complex, 9 to 50 percent slopes	25,203	1.4
104E	Badland, outcrop-Patent complex, 6 to 25 percent slopes	15,354	0.8
105	Havre silt loam, 0 to 3 percent slopes	1,682	*
106	Glendive fine sandy loam, 0 to 3 percent slopes	2,095	0.1
107	Kremlin loam, 0 to 3 percent slopes	859	*
108B	Hanly fine sandy loam, 0 to 6 percent slopes	1,323	*
109	Havre silt loam, wooded, 0 to 1 percent slopes	2,426	0.1
110B	Maltese-Gerda complex, 0 to 6 percent slopes	6,207	0.3
111D	Gerda-Kirby complex, 1 to 15 percent slopes	1,272	*
111F	Kirby-Scairt complex, 9 to 70 percent slopes	8,323	0.5
112F	Kirby-Badland, outcrop-Patent complex, 9 to 70 percent slopes	16,009	0.9
113F	Lonna-Cabbart silt loams, 6 to 35 percent slopes	11,870	0.6
114	Glendive and Havre soils, channeled, 0 to 3 percent slopes	4,835	0.3
115F	Badland, outcrop-Arikara-Cabbart complex, 15 to 70 percent slopes	80,144	4.4
116F	Kremlin-Cabbart loams, slumped, 9 to 40 percent slopes	8,175	0.4
117	Wolf Point silty clay loam, 0 to 1 percent slopes	481	*
118F	Lonna-Kirby-Cabbart complex, 3 to 50 percent slopes	2,144	0.1
119F	Patent-Badland, outcrop-Cabbart complex, 6 to 50 percent slopes	30,384	1.7
121F	Maltese-Lonna-Arikara complex, 3 to 50 percent slopes	3,644	0.2
127	Maschetah silt loam, 0 to 2 percent slopes	6,114	0.3
127B	Maschetah silt loam, 2 to 6 percent slopes	9,009	0.5
127C	Maschetah silt loam, 6 to 9 percent slopes	3,894	0.2
131B	Lonna silt loam, 1 to 6 percent slopes	516	*

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
131C	Lonna silt loam, 6 to 9 percent slopes	657	*
132C	Patent-Gerda-Slickspots complex, 1 to 9 percent slopes	5,375	0.3
138E	Scairt-Maltese-Boxwell complex, 3 to 25 percent slopes	19,502	1.1
145F	Zahl-Cabba-Arikara complex, 9 to 70 percent slopes	34,223	1.9
146B	Dooley fine sandy loam, 0 to 6 percent slopes	8,050	0.4
151B	Boxwell-Kremlin loams, 1 to 6 percent slopes	3,170	0.2
151D	Boxwell-Kremlin loams, 6 to 15 percent slopes	5,967	0.3
154F	Arikara-Shambo-Cabba loams, 9 to 70 percent slopes	18,181	1.0
161F	Beisigl-Flasher-Arikara complex, 15 to 70 percent slopes	3,135	0.2
164D	Vebar fine sandy loam, 3 to 15 percent slopes, extremely stony	276	*
171	Lohler silty clay, saline, 0 to 1 percent slopes	557	*
180	Badland	4,561	0.2
183F	Badland, outcrop-Cabba complex, 9 to 70 percent slopes	8,948	0.5
187F	Arikara-Cabbart loams, 15 to 70 percent slopes	2,302	0.1
193B	Chanta loam, 0 to 6 percent slopes	775	*
194F	Kirby-Arikara-Badland, outcrop complex, 15 to 70 percent slopes	3,359	0.2
195	Havrelon silty clay loam, saline, 0 to 1 percent slopes	235	*
199	Mckeen loam, ponded, 0 to 1 percent slopes	450	*
201F	Badland, outcrop-Cabbart complex, 6 to 70 percent slopes	18,085	1.0
202D	Boxwell-Scairt-Maltese complex, 6 to 15 percent slopes	1,710	*
203D	Rhame-Kremlin-Maltese complex, 1 to 15 percent slopes	2,658	0.1
203F	Rhame-Scairt-Kremlin complex, 15 to 35 percent slopes	2,362	0.1
205	Havre silt loam, 0 to 3 percent slopes, rarely flooded	2,079	0.1
206	Glendive fine sandy loam, 0 to 3 percent slopes, rarely flooded	496	*
207	Harriet silt loam, low precipitation, 0 to 3 percent slopes	46	*
211F	Cabba-Badland, outcrop-Arikara complex, 9 to 70 percent slopes	9,240	0.5
212	Trembles fine sandy loam, slightly wet, 0 to 2 percent slopes	1,355	*
213	Havrelon silty loam, slightly wet 0 to 2 percent slopes	7,264	0.4
214	Korchea loam, channeled, wooded, 0 to 2 percent slopes	3,104	0.2
217	Wolf Point silty clay loam, wooded, 0 to 1 percent slopes	1,257	*
218F	Cherry-Cabba-Brandenburg complex, 9 to 35 percent slopes	2,719	0.1
227	Haydraw silt loam, 0 to 3 percent slopes	154	*
227B	Haydraw silt loam, 3 to 6 percent slopes	121	*
231C	Patent-Gullied land-Glendive complex, 1 to 9 percent slopes	1,717	*
232C	Lambert-Slickspots-Rhoades complex, 1 to 9 percent slopes	3,500	0.2
238B	Janesburg-Dogtooth silt loams, 0 to 6 percent slopes	4,970	0.3
239D	Vebar-Janesburg fine sandy loams, 3 to 15 percent slopes	1,321	*
242F	Zahl-Williams-Arikara loams, 9 to 45 percent slopes	2,318	0.1
287F	Arikara-Cabba loams, 15 to 70 percent slopes	612	*
299	Minnewaukan-Banks-Riverwash complex, 0 to 3 percent slopes	2,158	0.1
317	Lallie silty clay, 0 to 1 percent slopes	88	*
331B	Cherry-Gullied land-Havrelon complex, 0 to 6 percent slopes	1,080	*
340B	Niobell-Williams loams, 0 to 6 percent slopes	6,092	0.3
341B	Noonan-Niobell-Williams loams, 0 to 6 percent slopes	6,715	0.4
341C	Noonan-Williams loams, 6 to 9 percent slopes	1,610	*
403F	Rhame-Arikara-Fleak complex, 9 to 50 percent slopes	19,145	1.0
404F	Badland, outcrop-Lambert-Cabba complex, 6 to 50 percent slopes	13,220	0.7
406	Glendive fine sandy loam, wooded, 0 to 3 percent slopes	1,754	*
408B	Hanly fine sandy loam, wooded, 0 to 6 percent slopes	3,404	0.2
410	Riverwash	806	*
411B	Lambert silt loam, 0 to 6 percent slopes	1,427	*
412E	Lambert-Brandenburg complex, 3 to 25 percent slopes	585	*
442F	Zahl-Williams loams, dissected, 15 to 45 percent slopes	32,397	1.8
460C	Zahl-Williams-Cabba complex, 6 to 9 percent slopes	18,283	1.0
460D	Zahl-Cabba-Williams complex, 9 to 15 percent slopes	28,325	1.5
470C	Zahl-Tally-Williams complex, 6 to 9 percent slopes	5,519	0.3
470D	Zahl-Beisigl-Tally complex, 9 to 15 percent slopes	15,845	0.9
490	Riverwash, low precipitation	166	*
496	Pits, gravel and sand, low precipitation	56	*
M-W	Miscellaneous water	100	*
W	Water	61,140	3.3
	Total	1,830,800	100.0

* Less than 0.1 percent.

Formation and Classification of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification.

Formation of the Soils

Soil forms through processes acting on deposited or accumulated geologic material. Characteristics of the soil at any given point are determined by (1) the physical and mineralogical composition of the parent material; (2) the climate under which the soil material has accumulated and existed since accumulation; (3) the plant and animal life on and in the soil; (4) the relief, or lay of the land; and (5) the length of time that forces of soil formation have acted on the soil material (Buol, et al., 1980).

Climate and plant and animal life are active factors of soil formation. They act on the parent material that has accumulated through the weathering of geological deposits and slowly change it to a natural body that has genetically related horizons. The effects of climate and plant and animal life are conditioned by relief. Finally, time is needed for changing the parent material into soil. Some time is always required for the differentiation of soil horizons. Usually, a long time is required for the development of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effects of any one factor unless conditions are specified for the other four. Many of the processes of soil development are unknown.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It determines the chemical and mineral composition of the soil. The soils of McKenzie County formed in materials of several origins, including glacial, eolian, residual, and alluvial.

The advancing glacier picked up rocks and soil, ground and mixed them, and deposited the material as the glacier receded. Some soils, such as Williams and Zahl, formed in unsorted material, or glacial till. Other soils, such as Tansem and Roseglen, formed in glaciolacustrine deposits or material deposited by water in glacial lakes. Other soils formed in glaciofluvial deposits or material deposited by glacial meltwater. Some of these soils, such as Schaller, formed in deposits of mostly sand. Other soils, such as Wabek and Stady, formed in deposits containing significant amounts of gravel. Deposits of eolian or windblown sediment over glacial till are the parent materials of the Dooley and Temvik soils. Tonka soils are an example of soils that formed in material deposited in swales and depressions created by melting glaciers.

Other soils formed from soft sedimentary residual bedrock. Flasher and Rhame soils formed in soft sandstone. Amor and Boxwell soils formed in soft sandstone and siltstone. Chama and Sen soils formed in soft siltstone. Moreau and Regent soils formed in soft siltstone and shale. Dogtooth and Janesburg soils formed in soft shales that are affected by an excess of sodium salts. Weathered soft sandstone is

also the source of some eolian material. Areas of Lihen and Telfer soils formed in these deposits. Other soils, such as Farnuf and Kremlin, formed in local alluvium that was transported from areas of soft bedrock. Some soils, such as Havrelon and Glendive, formed in alluvium deposits on floodplains.

Although the parent materials are of common origin, their properties vary greatly, sometimes within small areas, depending on how the materials were deposited.

McKenzie County is situated near the center of the Williston Basin, an intracratonic basin whose center is near Williston. Sedimentary deposits are up to 16,000 feet thick in this area (Carlson, 1985). The limit of glaciation generally follows the course of Bennie Pierre Creek and then eastward along the Little Missouri River. Upland areas within the glaciated region range from having patchy till near the limit of glaciation to nearly continuous till in the northern areas.

In the unglaciated areas, soils developed from poorly consolidated Tertiary-aged deposits. The oldest geologic formation exposed is the Bullion Creek Formation, which is at the surface in the western and southwestern parts of the county. The Sentinel Butte Formation is at the surface in most other areas. (fig. 17) Exposures of the Golden Valley Formation in McKenzie County are limited to a small area near Grassey Butte and the Blue Buttes area (Carlson, 1985).

Ground water suitable for domestic and livestock supplies in McKenzie County is available from three aquifer systems in deposits of Late Cretaceous and Tertiary Ages. Yields from these aquifers may be limited. Ground water from aquifers of Quaternary age is suitable for domestic, livestock, municipal, industrial, and irrigation uses. Yield is over 100 gallons per minute. Rocks older than Late Cretaceous age generally contain brackish water that is unsuitable for most purposes. Additional information concerning water supplies in the county is available (Croft, 1985).

Several processes have been involved in the formation of soils in McKenzie County. These processes are accumulation of organic matter; solution, transfer, and removal of calcium carbonates and bases; and liberation and translocation of silicate



Figure 17. A view of the Sentinel Butte geological formation.

clay minerals. In most soils more than one of these processes has been active in horizon differentiation.

The parent materials in which most of the soils developed initially contained generous amounts of calcium and magnesium carbonate minerals. These minerals have been dissolved by water and removed from the upper horizons of the soil profile. Pure water is not an effective agent for dissolving calcium and magnesium carbonates. These minerals are only slightly soluble in pure water, but become moderately soluble and dissolve much more rapidly in a weak acid. The respiratory activity of plants is a significant factor in dissolving calcium and magnesium carbonates. As plants respire, they give off carbon dioxide. Carbon dioxide dissolves in water to form a weak carbonic acid solution. This facilitates dissolving calcium and magnesium carbonates in the soil.

In a dissolved state, calcium and magnesium are in the form of ions that have a positive net electrical charge. Calcium and magnesium ions are essential elements in plant nutrition, and can either be taken up by plant roots or carried away (leached) with moving soil water. Some of the calcium and magnesium ions are leached from the soil profiles. "Seep" sites along steep slopes that have deposits of recently precipitated calcium and magnesium carbonates provide evidence of leaching.

A large number of the calcium and magnesium ions that dissolved from carbonate mineral ions are translocated to upper soil horizons by a cyclical process of root uptake and ultimate release when plant material decomposes. As vegetation decays, positively charged calcium and magnesium ions move downward with water to the upper horizons of soil profiles. There they are held by the electrostatic forces of negatively charged clay particles and are again available for plant uptake.

Climate

Climate has direct and indirect effects on the formation of soils. Precipitation, temperature, and wind directly affect the weathering and reworking of soil material. The climate indirectly affects soil formation through its effects on the amount and kind of vegetation and animal life on or in the soil.

In addition to weathering soil material, precipitation and temperature affect the leaching and redistribution of carbonates and clay particles and the accumulation of organic matter in the soil. Freezing and thawing help break down soil particles in the parent material, thereby providing more surface area for chemical processes. Cool temperatures affect the content of organic matter by slowing the decay of plant material and animal remains.

McKenzie County has a continental, semi-arid to subhumid climate characterized by long, cold winters and short, warm summers. The soil is generally frozen to a depth of 3 to 6 feet from November to April. During this time, except for some effects of frost action, the soil forming processes are mostly dormant. Most of the precipitation falls during the growing season and is distributed in an erratic pattern. It is during this part of the year that soil forming processes influenced by climate are most active. The climate is fairly uniform throughout the county.

Living Organisms

Soils in McKenzie County formed mainly under grassland vegetation. Grasses provide a plentiful supply of organic matter, which improves the chemical and physical properties of the soil. Fibrous roots of these grasses penetrate the soil to a depth of several feet, making it more porous and more granular. As a result of these changes in the soil, less water runs off the surface and more moisture is available for increased microbiological activity. Decay of plants improves the available water capacity, tilth, and fertility of the soil. Decayed organic matter, accumulating over long periods, gives the surface layer its dark color.

On somewhat poorly drained and moderately well drained, nearly level soils, such as Bowbells, Grail, and Hamerly the native vegetation is mainly tall and medium-sized grasses. Principal grasses are big bluestem, switchgrass, indiangrass, and little bluestem.

On well drained and excessively drained soils, such as Farnuf, Temvik, Williams, and Wabek, short and medium-sized grasses are dominant. Among these grasses are green needlegrass, western wheatgrass, little bluestem, needleandthread, plains muhly, and blue grama.

On the poorly drained and very poorly drained, depressional soils such as Dimmick and Tonka, the vegetation consists of tall grasses, reeds, slough sedge, and prairie cordgrass.

Micro-organisms have important effects on soil formation because they feed on undecomposed organic matter and convert it into humus from which plants can obtain nutrients for growth. Bacteria and different kinds of fungi attack leaves and other forms of organic matter. Insects, earthworms, and small burrowing animals help mix the humus with the soil.

Human activities greatly affect soil formation. Management measures can alter soil drainage. They can help to control erosion, thus maintaining fertility. Poor management can increase the susceptibility to erosion and thus result in an unproductive soil.

Topography

Most of McKenzie County is level to rolling, but some areas are hilly to very steep. The steepest areas are breaks around rivers and drainageways. Local differences in relief within a square mile range from less than 10 feet to 450 feet.

Relief influences the formation of soil through its effect on drainage, runoff, and erosion. Many differences in soils result from their topographic position. Among these differences are drainage, thickness of the A horizon, content of organic matter, color, features of the subsoil, thickness of the solum, and degree of soil horizon development.

Runoff is rapid on steep slopes, and only a small percentage of the rainfall penetrates the soil. Under these conditions, there is little moisture for plant growth and soil development. The soils on steeper slopes are thin and low in organic matter content. They have minimal horizonation. Examples are the Cabbart and Zahl soils.

Soils on nearly level to rolling slopes are moderately well drained and well drained. Moisture is sufficient to support good stands of mixed native grasses, and the soils have well developed profiles characterized by a very dark grayish brown to very dark brown A horizon and a brown to dark brown B horizon. Examples are the Farnuf and Williams soils. Most of the moderately well drained soils occur on level or slightly concave areas. They generally have a thicker A horizon, a darker colored B horizon, and a greater depth to lime than those on convex, undulating, or rolling landscapes. Examples are the Bowbells and Grail soils.

Depressional areas that receive large amounts of runoff from higher elevations have somewhat poor to very poor natural drainage. Soils formed in depressions vary widely in profile development, depending on the degree of wetness. Tonka soils, which are in shallow depressions, exhibit an advanced degree of horizonation because of alternate wet and dry cycles that occur in these depressions. These soils have properties much like soils from areas of much higher precipitation. They are examples of soils in which translocated clays have accumulated in the Bt horizon. Gleying, or the reduction and transfer of iron, has occurred to some degree in all of the very poorly to somewhat poorly drained soils in the county. In these naturally wet soils, this process has had a significant influence on horizon differentiation. The gray color and redoximorphic features of the subsoil indicate the redistribution of reduced iron oxides. Dimmick soils, which are in deep depressions, are wet for long periods,

and have a thick surface layer. Horizonation in these soils is minimal and mostly the result of sedimentary rather than soil-forming processes.

Bordering the major river valleys in the county are belts of deeply dissected and extremely rough land. Very steep slopes, extremely narrow ridge tops, and valleys characterize these areas. The difference in local relief throughout the Little Missouri Badlands is approximately 450 feet, throughout the Missouri Badlands it is approximately 300 feet, and along the Yellowstone River local relief is a little less than 300 feet (Carlson, 1985). Level to undulating areas near these rivers were influenced by stream flows that resulted in the deposition of sand and gravel. Soils in these areas include Chanta, Lehr, and Stady. Areas alongside these rivers are influenced by contemporary flooding and the deposition of sands, silts, and clays. Soils in these areas include Hanly, Havre, Korchea, and Lohler.

Time

The formation of soil is a very slow process. Much time is required for the processes of soil formation to act on the parent material and to form distinct horizons within the soil profile. In geological terms, the soils in the county are young.

More time has been available for the formation of Savage soils on uplands than for the formation of Lohler soils on flood plains. The forces of soil formation have been continually acting on the parent material of the Savage soils; however, Lohler soils are continually gaining new parent material at the surface as a result of flooding. Savage soils have well defined horizons whereas Lohler soils have less distinct horizons.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The "Classification of the Soils" table shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

Order. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in sol. An example is Mollisol.

Suborder. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustoll (Ust, meaning burnt, plus oll, from Mollisol).

Great Group. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplustoll (Hapl, meaning minimal horizonation, plus ustoll, the suborder of the Mollisols that has an ustic moisture regime).

Subgroup. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the

name of the great group. The adjective Pachic identifies the subgroup that has a thick epipedon. An example is Pachic Haplustolls.

Family. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, superactive, frigid Pachic Haplustolls.

Series. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. An example is the Arnegard soil series.

Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Absher	Fine, smectitic, frigid Leptic Torrertic Natrustalfs
Amor	Fine-loamy, mixed, superactive, frigid Typic Haplustolls
Arikara	Fine-loamy, mixed, superactive, frigid Typic Haplustepts
Arnegard	Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
Banks	Sandy, mixed, frigid Typic Ustifluvents
Beisigl	Mixed, frigid Typic Ustipsamments
Belfield	Fine, smectitic, frigid Glossic Natrustolls
Benz	Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
Blacksheep	Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents
Bowbells	Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
Bowdle	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Haplustolls
Boxwell	Fine-loamy, mixed, superactive, frigid Aridic Haplustolls
Brandenburg	Fragmental, mixed, frigid Typic Ustorthents
Breien	Sandy, mixed, frigid Mollic Ustifluvents
Bryant	Fine-silty, mixed, superactive, frigid Typic Haplustolls
Burgraff	Fine-silty, mixed, superactive, frigid Aridic Calciustolls
Cabba	Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
Cabbart	Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents
Chama	Fine-silty, mixed, superactive, frigid Typic Calciustolls
Chanta	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aridic Haplustolls
Cherry	Fine-silty, mixed, superactive, frigid Typic Haplustepts
Chinook	Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
Cohagen	Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
Cozberg	Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
Daglum	Fine, smectitic, frigid Vertic Natrustolls
Desart	Coarse-loamy, mixed, superactive, frigid Typic Natrustolls
Dimmick	Fine, smectitic, frigid Vertic Epiaquolls
Divide	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aeric Calciaquolls
Dogtooth	Fine, smectitic, frigid Leptic Natrustolls
Dooley	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Dovray	Fine, smectitic, frigid Cumulic Vertic Epiaquolls
Ekalaka	Coarse-loamy, mixed, superactive, frigid Typic Natrustolls
Ethridge	Fine, smectitic, frigid Torrertic Argiustolls
Farland	Fine-silty, mixed, superactive, frigid Typic Argiustolls
Farnuf	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Felor	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Flasher	Mixed, frigid, shallow Typic Ustipsamments
Flaxton	Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
Fleak	Mixed, frigid, shallow Aridic Ustipsamments
Floweree	Fine-silty, mixed, superactive, frigid Aridic Haplustolls
Gerda	Fine, smectitic, frigid Leptic Torrertic Natrustolls
Glendive	Coarse-loamy, mixed, superactive, calcareous, frigid Aridic Ustifluvents
Golva	Fine-silty, mixed, superactive, frigid Typic Haplustolls
Grail	Fine, smectitic, frigid Pachic Vertic Argiustolls
Grano	Fine, smectitic, frigid Typic Endoaquerts
Grassna	Fine-silty, mixed, superactive, frigid Pachic Haplustolls
Hamerly	Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
Hanly	Sandy, mixed, frigid Aridic Ustifluvents
Harriet	Fine, smectitic, frigid Typic Natraquolls
Havre	Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustifluvents
Havrelon	Fine-loamy, mixed, superactive, calcareous, frigid Typic Ustifluvents
Haydraw	Fine-silty, mixed, superactive, frigid Aridic Calciustolls
Heil	Fine, smectitic, frigid Typic Natraquerts
Hoffmanville	Clayey over sandy or sandy-skeletal, smectitic over mixed, calcareous, frigid Typic Ustifluvents
Janesburg	Fine, smectitic, frigid Typic Natrustolls
Kirby	Loamy-skeletal over fragmental, mixed, superactive, calcareous, frigid Aridic Ustorthents
Korchea	Fine-loamy, mixed, superactive, calcareous, frigid Mollic Ustifluvents
Korell	Fine-loamy, mixed, superactive, frigid Fluventic Haplustolls

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Krem	Fine-loamy, mixed, superactive, frigid Typic Paleustolls
Kremlin	Fine-loamy, mixed, superactive, frigid Aridic Haplustolls
Lakota	Coarse-loamy, mixed, superactive, frigid Leptic Natrustolls
Lallie	Fine, smectitic, calcareous, frigid Vertic Fluvaquents
Lambert	Fine-silty, mixed, superactive, calcareous, frigid Typic Ustorthents
Lawther	Fine, smectitic, frigid Typic Haplusterts
Lefor	Fine-loamy, mixed, semiactive, frigid Typic Argiustolls
Lehr	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
Lihen	Sandy, mixed, frigid Entic Haplustolls
Littlemo	Fine-loamy, mixed, superactive, frigid Aridic Haplustolls
Livona	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Lohler	Fine, smectitic, calcareous, frigid Vertic Ustifluvents
Lonna	Fine-silty, mixed, superactive, frigid Aridic Haplustepts
Makoti	Fine-silty, mixed, superactive, frigid Pachic Haplustolls
Maltese	Fine, smectitic, frigid Torrertic Natrustolls
Manning	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
Marysland	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Calciaquolls
Maschetah	Fine-silty, mixed, superactive, frigid Typic Calciustolls
Max	Fine-loamy, mixed, superactive, frigid Typic Haplustolls
Mckeen	Fine-loamy, mixed, superactive, calcareous, frigid Typic Fluvaquents
Minnewaukan	Mixed, frigid Typic Psammaquents
Miranda	Fine, smectitic, frigid Leptic Natrustolls
Moreau	Fine, smectitic, frigid Vertic Haplustolls
Morton	Fine-silty, mixed, superactive, frigid Typic Argiustolls
Niobell	Fine, smectitic, frigid Glossic Natrustolls
Noonan	Fine, smectitic, frigid Typic Natrustolls
Parnell	Fine, smectitic, frigid Vertic Argiaquolls
Parshall	Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
Patent	Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
Peta	Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
Reeder	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Regan	Fine-silty, mixed, superactive, frigid Typic Calciaquolls
Regent	Fine, smectitic, frigid Vertic Argiustolls
Rhame	Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
Rhoades	Fine, smectitic, frigid Leptic Vertic Natrustolls
Ridgelawn	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, calcareous, frigid Typic Ustifluvents
Ringling	Loamy-skeletal over fragmental, mixed, superactive, frigid Typic Haplustolls
Roseglen	Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
Sakakawea	Coarse-silty, mixed, superactive, frigid Typic Calciustolls
Savage	Fine, smectitic, frigid Vertic Argiustolls
Scairt	Fine, smectitic, frigid Aridic Leptic Natrustolls
Schaller	Sandy, mixed, frigid Entic Haplustolls
Scorio	Clayey over loamy, smectitic over mixed, superactive, calcareous, frigid Vertic Ustifluvents
Searing	Fine-loamy over fragmental, mixed, superactive, frigid Typic Haplustolls
*Searing	Fine-loamy over fragmental, mixed, superactive, frigid Aridic Haplustolls
Sen	Fine-silty, mixed, superactive, frigid Typic Haplustolls
Seroco	Mixed, frigid Typic Ustipsamments
Sham	Coarse-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
Shambo	Fine-loamy, mixed, superactive, frigid Typic Haplustolls
Stady	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
Straw	Fine-loamy, mixed, superactive, frigid Cumulic Haplustolls
Tally	Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
Tanna	Fine, smectitic, frigid Aridic Argiustolls
Tansem	Fine-loamy, mixed, superactive, frigid Typic Haplustolls
Telfer	Sandy, mixed, frigid Entic Haplustolls
Temvik	Fine-silty, mixed, superactive, frigid Typic Haplustolls
Tinsley	Sandy-skeletal, mixed, frigid Aridic Ustorthents
Tonka	Fine, smectitic, frigid Argiaquic Argialbolls

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Trembles	Coarse-loamy, mixed, superactive, calcareous, frigid Typic Ustifluvents
Tusler	Mixed, frigid Aridic Ustipsamments
Vebar	Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
Velva	Coarse-loamy, mixed, superactive, frigid Fluventic Haplustolls
Wabek	Sandy-skeletal, mixed, frigid Entic Haplustolls
Wanagan	Loamy-skeletal, mixed, superactive, frigid Typic Haplustolls
Wayden	Clayey, smectitic, calcareous, frigid, shallow Typic Ustorthents
Williams	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Wilton	Fine-silty, mixed, superactive, frigid Pachic Haplustolls
Wolf Point	Fine, smectitic, calcareous, frigid Torrertic Ustifluvents
Yawdim	Clayey, smectitic, calcareous, frigid, shallow Aridic Ustorthents
Zahl	Fine-loamy, mixed, superactive, frigid Typic Calciustolls

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetical order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (Soil Survey Staff, 1993). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (USDA-NRCS, 1999) and Keys to Soil Taxonomy (Soil Survey Staff, 1998). Effervescence refers to disseminated lime throughout the horizon. Following the pedon description is the range of important characteristics of the soil series.

Absher Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Very slow
Landform: Hills and ridges
Parent material: Alluvium
Slope: 1 to 9 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Leptic Torrertic Natrustalfs

Typical pedon:
Absher loam, about 2,520 feet east and 2,580 feet north of the southwest corner of sec. 17, T. 19 N., R. 1 E. (Colors are for dry soil unless otherwise stated.)

E—0 to 1 inch; light brownish gray (2.5Y 6/2) loam, very dark grayish brown (2.5Y 3/2) moist; moderate very thin platy structure parting to moderate very fine and fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; many unstained sand grains; neutral; abrupt wavy boundary.

Btn1—1 to 5 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong medium columnar structure; extremely hard, firm, sticky and plastic; many very fine and fine roots; many very fine and fine and few medium pores; few faint uncoated sand grains on vertical faces of peds; continuous distinct clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btn2—5 to 11 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; extremely hard, firm, sticky and plastic; many very fine and fine roots; many very fine and fine pores; continuous distinct clay films on faces of peds; slight effervescence; moderately alkaline; clear wavy boundary.

Btknyz—11 to 16 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong fine and medium subangular blocky structure; extremely hard, friable, sticky and plastic; many very fine and fine roots; many very fine and fine pores; moderately thick continuous clay films on faces of peds; few very fine masses of lime; common fine and medium crystals of gypsum and other salts; strong effervescence; strongly alkaline; clear wavy boundary.

Bknyz—16 to 32 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; extremely hard, firm, sticky and plastic; many very fine and fine roots; and many very fine and fine pores; many medium and coarse crystals of gypsum and other salts; common fine threads of lime; strong effervescence; strongly alkaline; clear wavy boundary.

Bkyz1—32 to 42 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; extremely hard, firm, sticky and plastic; common very fine and fine roots; many very fine and fine and few medium pores; common fine crystals of gypsum; common fine crystals of salt; few fine threads of lime; slight effervescence; strongly alkaline; diffuse wavy boundary.

Bkyz2—42 to 60 inches; very pale brown (10YR 7/3) clay, grayish brown (2.5Y 5/2) and brown (10YR 5/3) moist; silt loam varves that are massive and average 1 centimeter in thickness; extremely hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine crystals of gypsum and other salts; few fine threads of lime; slight effervescence; strongly alkaline.

Range in Characteristics

Depth to gypsum or other salts: less than 16 inches
Depth to the Btknyz horizon: 6 to 16 inches

E horizon:
Hue: 2.5Y, 10YR, or 7.5YR
Value: 6 or 7, 3 to 5 moist
Chroma: 1 to 3

Btn horizons:
Hue: 2.5Y, 7.5YR, or 10YR
Value: 4 to 6, 4 or 5 moist
Chroma: 1 to 3
Texture: silty clay, clay, or clay loam

Btknyz horizon:
Hue: 2.5Y, 10YR, or 7.5YR
Value: 4 to 6, 4 or 5 moist
Chroma: 2 or 3
Texture: clay loam, clay, or silty clay

Bk horizons:
Hue: 5Y, 2.5Y, 10YR, or 7.5YR
Value: 4 to 6 moist
Chroma: 2 to 4
Texture: clay loam, sandy clay loam, silty clay, clay, or silty clay loam

Amor Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate

Landform: Pediments, hills, knolls, and ridges
Parent material: Residuum
Slope: 0 to 25 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Amor loam, 2,300 feet east and 180 feet north of the southwest corner of sec. 2, T. 131 N., R. 103 W. (Colors are for dry soil unless otherwise stated.) (fig. 18)

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to weak medium and fine granular; slightly hard, friable, slightly sticky and nonplastic; many roots and pores; neutral; abrupt smooth boundary.

Bw1—8 to 13 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; few stains of dark grayish brown (10YR 4/2) dry on faces of peds; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common roots; many fine pores; neutral; gradual wavy boundary.

Bw2—13 to 19 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; common fine pores; slight effervescence; slightly alkaline; gradual wavy boundary.

Bk—19 to 31 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine roots; common fine pores; few masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

Cr—31 to 60 inches; pale yellow and light gray (2.5Y 7/3 and 5Y 7/2) soft sandstone and siltstone, light olive gray and light olive brown (5Y 6/2 and 2.5Y 5/3) moist; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 8 to 16 inches
Depth to lime: 14 to 40 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have a BCk horizon. Some pedons have an extremely stony A horizon.

Ap horizon:
Value: 3 or 4, 2 or 3 moist

Bw horizon:
Value: 4 to 6, 3 to 5 moist

Bk horizon:
Value: 5 to 7, 4 to 6 moist

Cr horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 3 to 7, 3 to 5 moist
Notes: It is soft mudstone, siltstone, or sandstone.

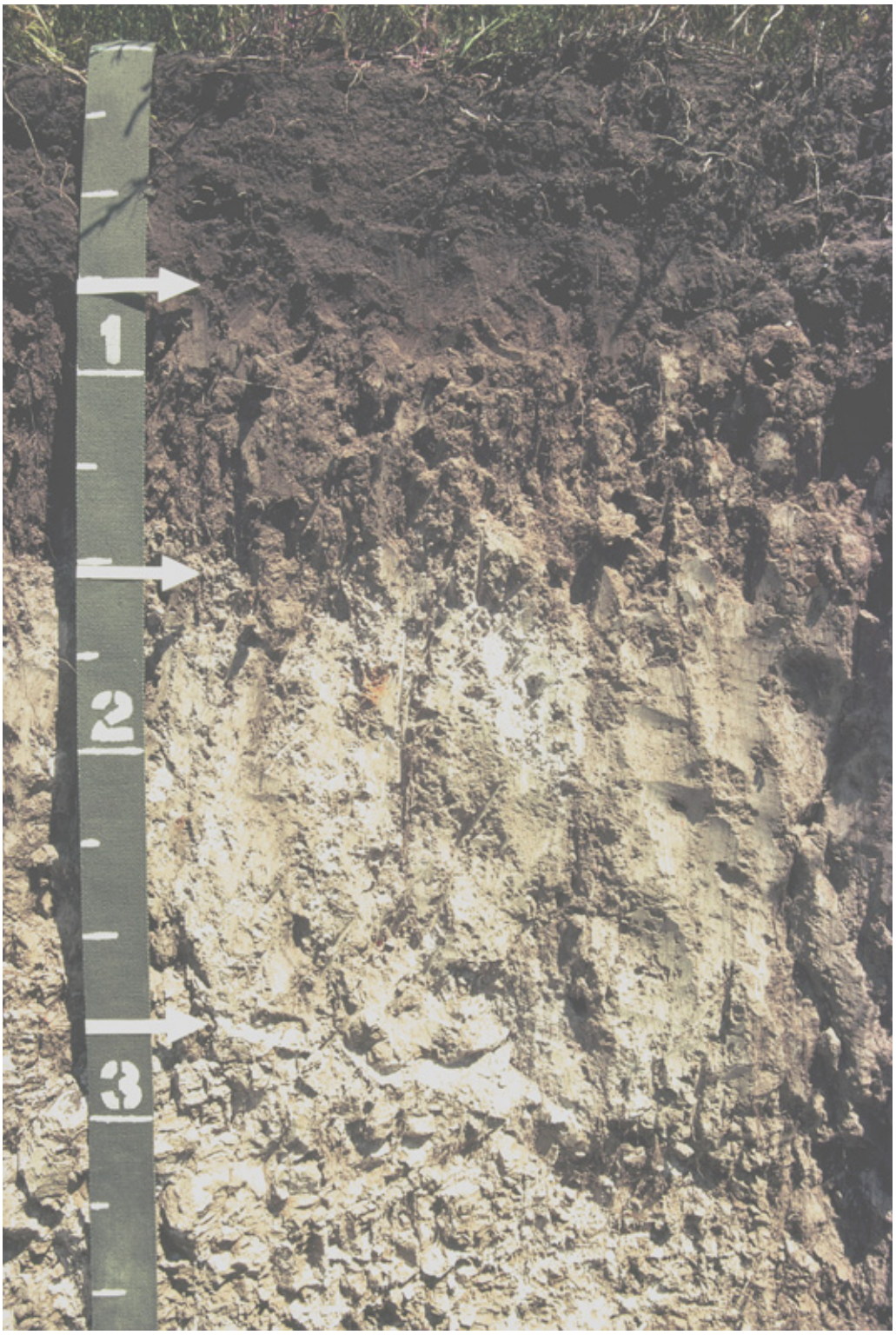


Figure 18. Typical profile of Amor loam.

Arikara Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Ridges
Parent material: Colluvium
Slope: 9 to 70 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Haplustepts

Typical pedon:
Arikara loam, 2,000 feet north and 1,000 feet east of the southwest corner of sec. 11, T. 148 N., R. 96 W. (Colors are for dry soil unless otherwise stated.)

0i—0 to 1 inches; forest litter and partially decomposed forest litter; abrupt smooth boundary.

A—1 to 2 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; few coarse and many fine and medium roots; slightly acid; abrupt wavy boundary.

Bw1—2 to 7 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky and plastic; common fine and medium roots; neutral; abrupt smooth boundary.

Bw2—7 to 14 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak medium and fine subangular blocky; hard, friable, sticky and plastic; common fine and medium roots; neutral; abrupt smooth boundary.

Bk—14 to 39 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 5/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few fine and medium roots; common masses of lime; strong effervescence; slightly alkaline; gradual wavy boundary.

C1—39 to 54 inches; olive brown (2.5Y 4/4) loam, light yellowish brown (2.5Y 6/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; slight effervescence; slightly alkaline; gradual wavy boundary.

C2—54 to 60 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, olive brown (2.5Y 4/4) moist; massive; loose, nonsticky and nonplastic; slight effervescence; slightly alkaline.

Range in Characteristics

Depth to lime: 11 to 28 inches

A horizon:
Value: 2 to 5, 2 or 3 moist
Chroma: 1 or 2
Texture: loam, clay loam, silt loam, or silty clay loam

Bw horizon:
Hue: 2.5Y or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4
Texture: loam, clay loam, silt loam, or silty clay loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 or 5 moist
Chroma: 1 to 4
Texture: loam, fine sandy loam, clay loam, or silt loam

Arnegard Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Swales, alluvial flats, stream terraces, and alluvial fans
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Pachic Haplustolls

Typical pedon:
Arnegard loam, 1,575 feet north and 1,700 feet west of the southeast corner of sec. 35, T. 132 N., R. 93 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and many very fine roots; neutral; clear smooth boundary.

A—6 to 13 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium prismatic structure parting to weak fine subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; neutral; gradual wavy boundary.

Bw1—13 to 27 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, friable, slightly sticky and slightly plastic; many very fine roots; neutral; clear wavy boundary.

Bw2—27 to 36 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 4/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; slightly alkaline; clear wavy boundary.

Bk—36 to 60 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few fine irregular masses of lime; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to more than 30 inches
Notes: Some pedons have a BCk or C horizon.

A horizon:
Value: 3 or 4, 2 or 3 moist

Bw horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, 2 to 4 moist

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 2 to 4

Banks Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic class: Sandy, mixed, frigid Typic Ustifluvents

Typical pedon:
Banks fine sandy loam, 2,165 feet east and 1,585 feet south of the northwest corner of sec. 5, T. 140 N., R. 81 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 4 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium granular structure; very friable; many roots; slight effervescence; slightly alkaline; abrupt wavy boundary.

C1—4 to 30 inches; light brownish gray (2.5Y 6/2) fine sand, grayish brown (2.5Y 5/2) moist; single grain; loose; few roots; slight effervescence; slightly alkaline; abrupt wavy boundary.

C2—30 to 60 inches; light brownish gray (2.5Y 6/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; some very thin (1/8 to 1/2 inch) bands of silt and very fine sand; slight effervescence; slightly alkaline.

Range in Characteristics

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 3 or 4 moist
Chroma: 2 or 3
Texture: very fine sandy loam or fine sandy loam

C horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Notes: It contains strata of very fine sand or finer materials in most pedons.

Beisigl Series

Depth class: Moderately deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Pediments, hills, and ridges
Parent material: Residuum
Slope: 0 to 35 percent

Taxonomic class: Mixed, frigid Typic Ustipsamments

Typical pedon:
Beisigl loamy fine sand, 1,460 feet south and 100 feet west of the northeast corner of sec. 15, T. 129 N., R. 92 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; grayish brown (10YR 5/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine pores; 1 percent sandstone channers; slight effervescence; slightly alkaline; clear smooth boundary.

Bk1—5 to 12 inches; light yellowish brown (2.5Y 6/4) loamy fine sand, light olive brown (2.5Y 5/4) moist; weak medium prismatic structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine pores; 1 percent sandstone channers; strong effervescence; moderately alkaline; clear smooth boundary.

Bk2—12 to 27 inches; pale yellow (2.5Y 7/4) loamy fine sand, light yellowish brown (2.5Y 6/4) moist; weak coarse and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine pores; 1 percent coarse sandstone channers; strong effervescence; moderately alkaline; gradual smooth boundary.

Cr—27 to 60 inches; pale yellow (2.5Y 7/4) soft calcareous sandstone, light yellowish brown (2.5Y 6/4) moist; hard and brittle when dry; fractures greater than 4 inches apart.

Range in Characteristics

Depth to soft bedrock: 20 to 40 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 2 or 3

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loamy fine sand, fine sand, or loamy sand

Cr horizon:
Value: 6 or 7, 5 or 6 moist
Chroma: 2 to 6
Notes: The sandstone is slightly hard or hard, brittle when dry, and easily crushed when moist.

Belfield Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landform: Alluvial flats, stream terraces, ridges, and alluvial fans
Parent material: Alluvium
Slope: 0 to 9 percent
Notes: These soils are sodic.

Taxonomic class: Fine, smectitic, frigid Glossic Natrustolls

Typical pedon:
Belfield silty clay loam, 2,320 feet east and 235 feet north of the southwest corner of sec. 36, T. 137 N., R. 98 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 9 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate very fine subangular blocky; very hard, friable; many roots; many very fine pores; common uncoated sand grains on faces of peds; slightly acid; clear wavy boundary.

E/B—9 to 12 inches; light brownish gray (2.5Y 6/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to weak medium platy which parts to strong very fine subangular blocky; very hard, friable; many roots; many very fine pores; thin light gray (10YR 7/1) dry uncoated sand grains on top of plates and discontinuous on bottom of plates; slightly acid; clear smooth boundary.

Btn1—12 to 17 inches; grayish brown (2.5Y 5/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; strong medium prismatic structure parting to strong medium and fine angular blocky; extremely hard, friable; common roots; many very fine pores; faint continuous clay films on faces of peds; common uncoated sand grains in the upper part and few in the lower part; neutral; clear wavy boundary.

Btn2—17 to 24 inches; light olive brown (2.5Y 5/4) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; very hard, friable; few roots; many fine pores; faint clay films of olive brown (2.5Y 4/3); slightly alkaline; clear wavy boundary.

Bk1—24 to 31 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to weak medium subangular blocky; very hard, friable; few roots; many fine and very fine pores; common threads and masses of lime; strong effervescence; moderately alkaline; clear wavy boundary.

Bk2—31 to 43 inches; light brownish gray (2.5Y 6/2) and white (2.5Y 8/2) silty clay loam, dark grayish brown (2.5Y 4/2) and light brownish gray (2.5Y 6/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; very hard, friable; many fine pores; many threads and masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

C—43 to 60 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; massive; very hard, friable; many fine pores; violent effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 25 inches
Depth to lime: 22 to 55 inches
Notes: Some pedons have a BC, a Bky, BC, or a BCky horizon.

A horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3

E/B horizon:
Notes: Some cultivated pedons do not have an E/B horizon.

Btn horizon:
Hue: 10YR or 2.5Y

Value: 4 to 6, 2 to 5 moist
Texture: clay loam, silty clay, or silty clay loam

C horizon:
Value: 5 to 7, 4 or 5 moist
Texture: loam, clay loam, or silty clay loam

Benz Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Alluvial fans
Parent material: Alluvium
Slope: 1 to 9 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents

Typical pedon:
Benz clay loam, about 2,520 feet south and 1,400 feet west of northeast corner of sec. 8, T. 21 N., R. 4 E. (Colors are for dry soil unless otherwise stated.)

A1—0 to 1/8 inch; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; vesicular surface crust.

A2—1/8 to 2 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; weak fine granular structure; very hard, friable, sticky and plastic; slight effervescence; strongly alkaline; clear boundary.

C1—2 to 12 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; extremely hard, friable, sticky and plastic; common fine and very fine pores; slight effervescence; strongly alkaline; diffuse wavy boundary.

C2—12 to 24 inches; light brownish gray (2.5Y 6/2) clay loam stratified with lenses of loam, dark grayish brown (2.5Y 4/2) moist; massive; extremely hard, friable, sticky and plastic; few fine and very fine roots; few fine and very fine pores; few fine threads and masses of lime; strong effervescence; very strongly alkaline; diffuse boundary.

C3—24 to 66 inches; light brownish gray (2.5Y 6/2) loam stratified with thin lenses of fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; extremely hard, friable, sticky and slightly plastic; few roots and pores; few fine threads of lime; few fine threads of gypsum; strong effervescence; very strongly alkaline.

Range in Characteristics

Notes: Some pedons have a Ck horizon.

A horizon:
Hue: 2.5Y or 10YR
Chroma: 2 or 3

C horizon:
Hue: 5Y, 2.5Y, or 10YR
Value: 5 to 8, 4 to 6 moist
Chroma: 2 or 3
Texture: loam, clay loam, silt loam, or fine sandy loam

Blacksheep Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Ridges, pediments, and hills
Parent material: Residuum
Slope: 3 to 50 percent.
Notes: These soils are calcareous.

Taxonomic class: Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents

Typical pedon:
Blacksheep fine sandy loam, 1,500 feet north and 1,200 feet east of the southwest corner of sec. 32, T. 2 N., R. 46 E. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common very fine tubular pores; slightly alkaline; clear smooth boundary.

Bk—6 to 16 inches; light gray (2.5Y 7/2) very fine sandy loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to weak fine subangular blocky; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and few fine tubular pores; few medium masses of lime; violent effervescence; moderately alkaline; clear smooth boundary.

Cr—16 to 60 inches; light gray (10YR 7/2) semiconsolidated sandstone; strong effervescence; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 2.5Y, 7.5YR, or 10YR
Value: 5 to 7, 4 or 5 moist
Chroma: 2 or 3

Bk horizon:
Hue: 2.5Y, 7.5YR, or 10YR
Value: 5 to 7, 5 or 6 moist
Chroma: 2 to 4
Texture: very fine sandy loam, fine sandy loam, or sandy loam

Bowbells Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Till plains
Parent material: Glacial till and alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Pachic Argiustolls

Typical pedon:
Bowbells loam, 2,040 feet south and 365 feet west of the northeast corner of sec. 32, T. 151 N., R. 85 W. (Colors are for moist soil unless otherwise stated.)

A—0 to 6 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak medium prismatic and moderate medium subangular blocky structure parting to strong fine granular; slightly hard, friable, many roots; many fine pores; neutral; clear wavy boundary.

Bt1—6 to 14 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, friable; common fine roots; many fine pores; faint very dark brown (10YR 2/2) clay films on faces of peds; neutral; gradual wavy boundary.

Bt2—14 to 23 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, friable; common fine roots; common fine pores; faint clay films on faces of prisms and blocks; neutral; clear wavy boundary.

Bk—23 to 36 inches; pale yellow (2.5Y 7/4) loam, light olive brown (2.5Y 5/4) moist; weak medium and fine subangular blocky structure; hard, friable; few fine roots; common fine masses of lime; violent effervescence; moderately alkaline; clear wavy boundary.

C—36 to 60 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; massive but fractures into weak laminar and fine subangular blocks characteristic of till; hard, firm; few fine masses of lime; few stones; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to more than 30 inches
Notes: Some pedons have a BCk horizon.

A horizon:
Value: 3 or 4, 2 or 3 moist

Bt horizon:
Hue: 10YR or 2.5Y

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 or 5 moist

C horizon:
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 4
Texture: loam or clay loam

Bowdle Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over rapid
Landform: Stream terraces
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Haplustolls

Typical pedon:
Bowdle loam, 265 feet east and 230 feet south of northwest corner of sec. 7, T. 122 N., R. 73 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 8 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; soft, friable, slightly plastic; neutral; abrupt smooth boundary.

Bw1—8 to 16 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate medium prismatic structure parting to moderate medium angular and subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; neutral; clear smooth boundary.

Bw2—16 to 22 inches; very dark brown (10YR 2/2) crushing to very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few pebbles coated with lime; neutral; abrupt wavy boundary.

Bk—22 to 25 inches; very dark grayish brown (2.5Y 3/2) crushing to dark grayish brown (2.5Y 4/2) gravelly loam, grayish brown (2.5Y 5/2) dry; weak coarse prismatic structure parting to weak medium subangular blocky; hard, very friable, slightly sticky and slightly plastic; common fine accumulations of lime; strong effervescence; slightly alkaline; abrupt wavy boundary.

2C1—25 to 30 inches; varicolored, very gravelly loamy sand; common fine fragments of shale; strong effervescence; slightly alkaline; clear smooth boundary.

2C2—30 to 60 inches; varicolored, very gravelly loamy sand; common fine fragments of shale; slight effervescence; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to more than 28 inches
Depth to sand and gravel: 20 to 40 inches
Notes: Some pedons do not have a Bk horizon.

Ap horizon:
Value: 2 or 3, 3 or 4 dry

2C horizon:
Hue: 10YR or 2.5Y
Notes: Rock fragments range from 5 to 40 percent, but average more than 15 percent above a depth of 40 inches.

Boxwell Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Landform: Ridges, pediments, and hills
Parent material: Residuum
Slope: 1 to 50 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Boxwell loam, 200 feet north and 1,600 feet east of the center of sec. 24, T. 26 N., R. 8 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 5 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine interstitial pores; neutral; abrupt smooth boundary.

Bw1—5 to 9 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure; slightly hard, friable, moderately sticky and moderately plastic; coatings of dark grayish brown (10YR 4/2); common fine roots; common fine tubular pores; neutral; clear smooth boundary.

Bw2—9 to 14 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure; slightly hard, very friable, moderately sticky and moderately plastic; common fine roots; common fine tubular pores; slight effervescence; slightly alkaline; clear wavy boundary.

Bk—14 to 28 inches; white (5Y 8/2) loam, light gray (5Y 7/2) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common fine pores; many fine masses of lime; violent effervescence; moderately alkaline; gradual smooth boundary.

Cr—28 to 60 inches; light gray (5Y 7/2) semiconsolidated sandstone that crushes to a sandy loam, light olive gray (5Y 6/2) moist; upper part strong effervescence.

Range in Characteristics

Depth to the Bk horizon: 8 to 16 inches
Depth to soft bedrock: 20 to 40 inches

Ap horizon:
Hue: 10YR or 2.5Y
Chroma: 2 or 3
Texture: loam or silt loam

Bw horizon:
Value: 4 to 7, 3 to 5 moist
Chroma: 2 to 4
Texture: clay loam, loam, or silty clay loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 6 to 8, 4 to 7 moist
Chroma: 2 or 3
Texture: silt loam, loam, or very fine sandy loam

Cr horizon:
Notes: It is semiconsolidated sandstone, siltstone, mudstone, or a combination of these materials interbedded. They crush to a very fine sandy loam, sandy loam, silt loam, or silty clay loam.

Brandenburg Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Moderate over very rapid

Landform: Ridges, pediments, and hills
Parent material: Residuum
Slope: 3 to 35 percent

Taxonomic class: Fragmental, mixed, frigid Typic Ustorthents

Typical pedon:
Brandenburg channery loam, 1,485 feet north of the southwest corner of sec. 33, T. 132 N., R. 101 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 4 inches; pinkish gray (7.5YR 6/2) channery loam, brown (7.5YR 4/2) moist; moderate fine granular structure; slightly hard, very friable; many fine roots; 15 to 30 percent by volume small porcelanite chips; slight effervescence; slightly alkaline; clear wavy boundary.

C1—4 to 10 inches; reddish yellow (5YR 6/6) very channery loam, yellowish red (5YR 4/6) moist; weak medium and fine subangular blocky structure; soft, very friable; over 50 percent by volume porcelanite with thin carbonate crusts on undersides; strong effervescence; moderately alkaline; clear irregular boundary.

C2—10 to 60 inches; shattered porcelanite which is slightly weathered in upper 2 to 10 inches; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 0 to 3 inches
Depth to fragmental material: 10 to 20 inches

A horizon:
Hue: 7.5YR or 5YR
Value: 4 to 6
Chroma: 2 to 4
Notes: Rock fragments range from 15 to 35 percent.

C horizon:
Hue: 7.5YR or 5YR
Value: 5 to 7, 3 to 5 moist
Chroma: 2 to 4

Breien Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid over rapid
Landform: Flood plains and low terraces
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic class: Sandy, mixed, frigid Mollic Ustifluvents

Typical pedon:
Breien fine sandy loam, 1,020 feet west and 380 feet south of the northeast corner of sec. 36, T. 132 N., R. 84 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; neutral; abrupt smooth boundary.

C1—6 to 10 inches; dark brown (10YR 3/3) stratified fine sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very

friable, slightly sticky and slightly plastic; few fine roots; 1/2 inch to 1 1/4 inch thick strata of loam and loamy fine sand; neutral; clear smooth boundary.

C2—10 to 15 inches; dark grayish brown (10YR 4/2) stratified fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; 1/2 inch to 1 1/2 inch thick strata of loam, very fine sandy loam and sandy loam; slightly alkaline; clear irregular boundary.

C3—15 to 22 inches; light brownish gray (2.5Y 6/2) stratified loamy fine sand, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure parting to single grain; soft, very friable, nonsticky and nonplastic; few fine roots; thin strata of sand; strong effervescence; moderately alkaline; clear wavy boundary.

C4—22 to 60 inches; light brownish gray (2.5Y 6/2) stratified fine sand, grayish brown (2.5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; slightly alkaline.

Range in Characteristics

Depth to lime: more than 10 inches
Depth to loamy fine sand and coarser material: 14 to 20 inches
Notes: Some pedons contain one or more layers of very fine sand, loam, or finer materials. Some pedons have thin layers of gravel.

A horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3
Texture: fine sandy loam or loam

C horizon:
Value: 3 to 6, 2 to 5 moist
Chroma: 2 or 3
Texture: fine sandy loam, fine sand, loamy fine sand, loamy sand, or sand
Notes: Values of 5 or less dry and 3 or less moist usually are in the upper part. Where fine sandy loam is present it is in the upper 4 to 15 inches only.

Bryant Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Plains
Parent material: Eolian
Slope: 0 to 3 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Bryant loam, 2,360 feet east and 215 feet north of the southwest corner of sec. 21, T. 123 N., R. 71 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak coarse subangular blocky and moderate fine and medium granular structure; slightly hard, very friable; neutral; abrupt smooth boundary.

Bw—8 to 15 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine

and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few rock fragments; neutral; abrupt wavy boundary.

Bk1—15 to 19 inches; light brownish gray (2.5Y 6/2) loam, olive brown (2.5Y 4/4) moist; weak medium prismatic structure; soft, friable, slightly sticky and slightly plastic; few rock fragments; common medium accumulations of lime; strong effervescence (17 percent calcium carbonate); moderately alkaline; clear smooth boundary.

Bk2—19 to 32 inches; light brownish gray (2.5Y 6/2) loam, olive brown (2.5Y 4/4) moist; massive; soft, friable; few rock fragments; common coarse accumulations of lime; violent effervescence (24 percent calcium carbonate); moderately alkaline; clear smooth boundary.

C—32 to 60 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 4/3) moist; many medium prominent reddish yellow (7.5YR 7/8) dry redoximorphic concentrations and light gray (10YR 7/1) dry redoximorphic depletions; massive; soft, friable; few rock fragments; strong effervescence (14 percent calcium carbonate); moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Ap horizon:
Value: 4 or 5, 2 or 3 moist

Bw horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 2 to 4
Texture: loam, silt loam, or clay loam

Bk horizon:
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: loam or silt loam

C horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam, silt loam, or silty clay loam

Burgraff Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Landform: Pediments, hills, and ridges
Parent material: Residuum
Slope: 3 to 35 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-silty, mixed, superactive, frigid Aridic Calciustolls

Typical pedon:
Burgraff silt loam, 2,500 feet south and 2,400 feet east of the northwest corner of sec. 34, T. 20 N., R. 6 W. (Colors are for dry soil unless otherwise stated.)

A1—0 to 3 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; strong effervescence; slightly alkaline; clear smooth boundary.

A2—3 to 6 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots; many very fine tubular and interstitial pores; strong effervescence; slightly alkaline; clear smooth boundary.

Bk1—6 to 17 inches; pinkish gray (7.5YR 7/2) silt loam, pinkish gray (7.5YR 6/2) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; 5 percent soft angular pebbles of siltstone; many fine and medium seams of lime; continuous faint coatings of lime on faces of peds; violent effervescence; moderately alkaline; gradual smooth boundary.

Bk2—17 to 27 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; weak medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; 20 percent small, soft, angular pebbles of siltstone; common fine and medium seams of lime; continuous faint coatings of lime on faces of peds; violent effervescence; moderately alkaline; gradual smooth boundary.

Cr—27 to 60 inches; gray (5Y 6/1) fractured semiconsolidated siltstone; few fine roots in fractures in upper part; strong effervescence.

Range in Characteristics

Depth to soft bedrock: 20 to 40 inches
Particle-size control section: 20 to 30 percent clay

A horizon:
Hue: 7.5YR or 10YR
Chroma: 2 or 3

Bk horizon:
Hue: 10YR, 7.5YR, or 2.5Y
Value: 7 or 8
Chroma: 2 or 3
Texture: silt loam or silty clay loam

Cabba Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Landform: Pediments, hills, knolls, divides, escarpments, and ridges
Parent material: Residuum
Slope: 3 to 70 percent
Notes: These soils are calcareous.

Taxonomic class: Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents

Typical pedon:
Cabba loam, 2,100 feet north and 1,000 feet east of the southwest corner of sec. 15, T. 21 N., R. 9 E. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; slight effervescence; slightly alkaline; clear smooth boundary.

Bk1—3 to 8 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; common fine masses of lime; strong effervescence; slightly alkaline; clear wavy boundary.

Bk2—8 to 15 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; strong thin platy structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine pores; common fine masses of lime; strong effervescence; moderately alkaline; clear wavy boundary.

Cr—15 to 60 inches; pale brown (10YR 6/3) semiconsolidated sedimentary beds consisting of interbedded sandstone and shale, brown (10YR 5/3) moist; few very fine and fine roots in vertical cracks in upper part; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to soft bedrock: 10 to 20 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 6, 3 or 4 moist
Chroma: 1 to 4
Texture: loam or silt loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 8, 4 to 7 moist
Chroma: 1 to 6
Texture: loam, silt loam, clay loam, or silty clay loam

Cr horizon:
Notes: It is interbedded layers of siltstone, sandstone, or shale that crush to loam, silt loam, very fine sandy loam, clay loam, or silty clay loam.

Cabbart Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Landform: Ridges, pediments, escarpments, and hills
Parent material: Residuum
Slope: 3 to 70
Notes: These soils are calcareous.

Taxonomic class: Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents

Typical pedon:
Cabbart loam, about 2,450 feet east and 1,200 feet north of southwest corner of sec. 7, T. 20 N., R. 3 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine pores; strong effervescence; moderately alkaline; clear wavy boundary.

Bk1—3 to 7 inches; light brownish gray (2.5Y 6/2) loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure; hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine pores; few fine masses of lime; strong effervescence; moderately alkaline; clear wavy boundary.

Bk2—7 to 16 inches; pale yellow (2.5Y 7/4) loam, light yellowish brown (2.5Y 6/4) moist; weak coarse prismatic structure; hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine pores; common fine masses of lime; strong effervescence; moderately alkaline; clear wavy boundary.

BC—16 to 18 inches; pale yellow (2.5Y 7/4) loam, light yellowish brown (2.5Y 6/4) moist; weak coarse prismatic structure; very hard, friable, slightly sticky and slightly plastic; many fine roots; many fine pores; disseminated lime; strong effervescence; moderately alkaline; clear wavy boundary.

Cr—18 to 60 inches; pale yellow (5Y 7/4) semiconsolidated loamy sedimentary beds that crush to loam; few widely spaced vertical cracks in upper 4 to 6 inches with roots; root mat at contact of beds.

Range in Characteristics

Depth to soft bedrock: 10 to 20 inches
Notes: Some pedons have a C horizon.

A horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 3 to 5 moist
Chroma: 2 to 4
Texture: loam or silt loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 8, 3 to 6 moist
Texture: loam, clay loam, silt loam, or silty clay loam

BC horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 8, 4 to 6 moist
Chroma: 3 or 4
Texture: loam, clay loam, silt loam, or silty clay loam

Chama Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills, knolls, pediments, and ridges
Parent material: Residuum

Slope: 0 to 45 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Calciustolls

Typical pedon:
Chama silt loam, 1,120 feet east and 1,180 feet north of the southwest corner of sec. 15, T. 136 N., R. 99 W. (Colors are for dry soil unless otherwise stated.) (fig. 19)

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; neutral; abrupt smooth boundary.

Bw—4 to 8 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and nonplastic; slight effervescence; slightly alkaline; clear smooth boundary.

Bk1—8 to 13 inches; light gray (2.5Y 7/2) silt loam, light olive brown (2.5Y 5/4) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and nonplastic; many fine masses of lime; violent effervescence; slightly alkaline; clear smooth boundary.

Bk2—13 to 22 inches; light yellowish brown (2.5Y 6/4) silt loam, olive brown (2.5Y 4/4) moist; weak medium subangular blocky and weak thick platy structure; slightly hard, friable, slightly sticky and nonplastic; many medium masses of lime; violent effervescence; slightly alkaline; clear smooth boundary.

BCk—22 to 34 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; many large lime concretions; slight effervescence; slightly alkaline; gradual wavy boundary.

Cr—34 to 60 inches; pale yellow (2.5Y 7/4) soft siltstone, light olive brown (2.5Y 5/4) moist; slight effervescence; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 10 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have a C horizon above the Cr horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, 2 or 3 moist
Texture: silt loam or loam

Bw horizon:
Hue: 2.5Y or 10YR
Value: 4 to 7, 3 to 6 moist
Chroma: 2 or 3
Texture: silt loam or silty clay loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 7, 3 to 6 moist
Texture: silt loam or silty clay loam



Figure 19. Typical profile of Chama silt loam.

Chanta Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over rapid
Landform: Paleoterraces and escarpments
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Chanta loam, 2,375 feet east and 50 feet south of northwest corner of sec. 13, T. 132 N., R. 107 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky and granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine pores; neutral; clear smooth boundary.

Bw1—6 to 14 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate medium and fine prismatic structure parting to moderate medium and fine angular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; many pores; few faint very dark grayish brown (10YR 3/2) moist clay films on faces of prisms; few pebbles; neutral; clear smooth boundary.

Bw2—14 to 22 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium and fine prismatic structure parting to moderate medium and fine subangular blocky; hard, friable, slightly sticky and slightly plastic; few fine roots; common fine pores; neutral; clear wavy boundary.

Bw3—22 to 26 inches; grayish brown (2.5Y 5/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few pebbles; slightly alkaline; clear wavy boundary.

2Bk—26 to 29 inches; grayish brown (2.5Y 5/2) very gravelly sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; about 40 percent rock fragments; carbonates coat pebbles and occur as masses on undersides of pebbles; strong effervescence; moderately alkaline; clear wavy boundary.

2C—29 to 60 inches; light brownish gray (2.5Y 6/2) gravelly sand, grayish brown (2.5Y 5/2) moist; single grain; loose; about 30 percent rock fragments; carbonates coat undersides of pebbles; slight effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 16 to 30 inches
Depth to sand and gravel: 20 to 40 inches
Notes: Some pedons have a Bk horizon.

A horizon:
Value: 4 or 5
Chroma: 2 or 3
Texture: loam or silt loam
Notes: Rock fragments range from 0 to 15 percent.

Bw horizon:
Chroma: 2 to 4
Texture: loam or clay loam
Notes: Layers of sandy loam less than 5 inches thick occur in the lower part in some pedons. Rock fragments range from 5 to 20 percent.

2Bk horizon:
Value: 5 to 7, 4 or 5 moist
Texture: sand or coarse sand
Notes: Rock fragments range from 15 to 70 percent.

2C horizon:
Value: 5 or 6, 4 or 5 moist
Texture: sand or coarse sand
Notes: Rock fragments range from 15 to 60 percent.

Cherry Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow or slow
Landform: Alluvial fans
Parent material: Alluvium
Slope: 0 to 25 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Haplustepts

Typical pedon:
Cherry silt loam, 405 feet north and 135 feet east of the southwest corner of sec. 5, T. 138 N., R. 93 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky structure parting to moderate fine granular; hard, friable, sticky and plastic; many fine roots; many fine pores; slightly alkaline; abrupt smooth boundary.

Bw1—3 to 15 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure parting to moderate medium and fine angular blocky; hard, friable, sticky and plastic; common roots; common fine pores; thin patches of clay films on vertical faces of peds; strong effervescence; many fine threads of carbonates; moderately alkaline; gradual wavy boundary.

Bw2—15 to 33 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to strong medium and fine subangular blocky; hard, friable, sticky and plastic; few roots; common fine pores; many fine threads and few medium masses of carbonates; strong effervescence; moderately alkaline; gradual wavy boundary.

C—33 to 60 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; moderate medium and fine subangular blocky structure; hard, friable, sticky and plastic; some stratification present; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 0 to 5 inches
10 to 40 inch particle-size control section: averages between 27 and 35 percent clay but ranges from 18 to 35 percent

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 3 or 4 moist
Chroma: 2 or 3
Texture: silt loam or silty clay loam, but some is loam, clay, or clay loam

Bw horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam
Notes: Some pedons have a BCk horizon.

C horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: silty clay, silty clay loam, clay loam, or silt loam, and is stratified in many pedons
Notes: Coarser or finer textures are in some pedons below a depth of 40 inches.

Chinook Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Alluvial fans, paleoterraces, hills, escarpments, and ridges
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Chinook fine sandy loam, 660 feet north and 500 feet east of the southwest corner of sec. 27, T. 32 N., R. 15 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; many fine pores; neutral; abrupt wavy boundary.

Bw1—6 to 9 inches; dark yellowish brown (10YR 4/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine pores; neutral; clear smooth boundary.

Bw2—9 to 15 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine and fine pores; neutral; clear boundary.

Bk—15 to 32 inches; grayish brown (2.5Y 5/2) fine sandy loam, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; few very fine and fine pores; few threads and seams of lime; strong effervescence; moderately alkaline; gradual smooth boundary.

BCk—32 to 40 inches; pale olive (5Y 6/3) fine sandy loam, olive (5Y 5/3) moist; stratified; hard, friable, nonsticky and nonplastic; common very fine and fine roots; few very fine and fine pores; few threads and seams of lime; strong effervescence; moderately alkaline; gradual smooth boundary.

C1—40 to 52 inches; olive gray (5Y 5/2) fine sandy loam, olive (5Y 5/3) moist; massive; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; strong effervescence; moderately alkaline; diffuse boundary.

C2—52 to 66 inches; olive gray (5Y 5/2) fine sandy loam, olive (5Y 4/3) moist; single grain; loose; lenses of loamy fine sand; slight effervescence; moderately alkaline.

Range in Characteristics

10 to 40 inch particle-size control section: sandy loam or fine sandy loam and has less than 18 percent clay.
Percent rock fragments: 0 to 15 percent

Ap horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 2 or 3 moist
Texture: fine sandy loam or sandy loam

Bw horizon:
Hue: 10YR or 2.5Y
Chroma: 2 to 4
Texture: fine sandy loam or sandy loam

Bk horizon:
Hue: 2.5Y or 5Y
Value: 5 or 6, 4 or 5 moist
Texture: fine sandy loam or sandy loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 or 6
Chroma: 2 to 4
Texture: fine sandy loam, loamy fine sand, or sandy loam

Cohagen Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Hills, knolls, pediments, and ridges
Parent material: Residuum
Slope: 3 to 50 percent
Notes: These soils are calcareous.

Taxonomic class: Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents

Typical pedon:
Cohagen fine sandy loam, 2,360 feet east and 250 feet north of the southwest corner of sec. 29, T. 143 N., R. 85 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak

medium granular; slightly hard, very friable; many roots; slight effervescence; slightly alkaline; clear wavy boundary.

C1—3 to 8 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; slightly hard, very friable; common roots; slight effervescence; slightly alkaline; gradual boundary.

C2—8 to 17 inches; light yellowish brown (2.5Y 6/4) and light olive brown (2.5Y 5/5) fine sandy loam, olive brown (2.5Y 4/4) moist; weak medium subangular blocky structure; hard, friable; common grading to few roots; 25 percent soft sandstone fragments; slight effervescence; moderately alkaline; clear wavy boundary.

Cr—17 to 40 inches; pale yellow (2.5Y 7/4) and light yellowish brown (2.5Y 6/4) soft calcareous sandstone, light olive brown (2.5Y 5/4) moist; massive; slightly hard and brittle; soft and easily crushed; few roots in cracks in upper part; few seams of lime.

Range in Characteristics

Notes: Depth to soft bedrock is 10 to 20 inches.

Ap horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 2 or 3

C horizon:
Hue: 2.5Y or 10YR
Value: 5 to 7, 4 or 5 moist

Cozberg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Paleoterraces and escarpments
Parent material: Alluvium
Slope: 1 to 15 percent

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Cozberg loam, 1,000 feet south and 400 feet east of the northwest corner of sec. 26, T. 35 N., R. 25 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many fine pores; neutral; clear wavy boundary.

Bw1—7 to 12 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; common fine pores; neutral; clear wavy boundary.

Bw2—12 to 20 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and medium pores; slightly alkaline; clear wavy boundary.

Bk1—20 to 26 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; few fine and very fine roots; common fine pores; 5 percent pebbles; few faint lime coatings on surface of pebbles; slight effervescence; abrupt wavy boundary.

2Bk2—26 to 30 inches; light brownish gray (2.5Y 6/2) gravelly loamy sand, grayish brown (2.5Y 5/2) moist; single grain; loose; 20 percent pebbles; common large masses of lime; continuous distinct crusts on surface of pebbles; strong effervescence; moderately alkaline; gradual wavy boundary.

2C—30 to 60 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; single grain; loose; 10 percent pebbles; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to the calcic horizon: 16 to 25 inches
Depth to the lithological discontinuity: 20 to 40 inches
Notes: The material above the discontinuity has less than 50 percent fine sand and coarser sand.

A horizon:
Value: 2 or 3 moist
Chroma: 2 or 3
Notes: Rock fragments range from 0 to 15 percent.

Bw horizon:
Value: 5 or 6, 3 to 5 moist
Texture: fine sandy loam or sandy loam
Notes: Rock fragments range from 0 to 15 percent.

Bk horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: fine sandy loam or sandy loam
Notes: Rock fragments range from 0 to 15 percent.

2Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loamy sand, sandy loam, loamy coarse sand, or coarse sand
Notes: Rock fragments range from 0 to 30 percent.

2C horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 6
Texture: loamy sand, sand, loamy coarse sand, or coarse sand
Notes: Rock fragments range from 0 to 35 percent.

Daglum Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow

Landform: Alluvial flats, alluvial fans, ridges, and stream terraces
Parent material: Alluvium
Slope: 0 to 9 percent
Notes: These soils are sodic.

Taxonomic class: Fine, smectitic, frigid Vertic Natrustolls

Typical pedon:
Daglum silt loam, 1,950 feet east and 1,355 feet north of the southwest corner of sec. 26, T. 132 N., R. 98 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; slightly acid; abrupt smooth boundary.

E—7 to 8 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure parting to moderate fine subangular blocky and weak medium platy; slightly hard, friable, slightly sticky and slightly plastic; many very fine pores; light gray (10YR 7/2) dry coatings; slightly acid; clear smooth boundary.

Btn1—8 to 14 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong fine and medium columnar structure parting to strong fine and medium angular blocky; extremely hard, very firm, very sticky and plastic; common very fine roots along faces of peds; many very fine pores; light gray (10YR 7/2) dry silt coatings on tops of columns; many faint clay films on faces of peds; very dark brown (10YR 2/2) coatings on faces of peds; slightly alkaline; gradual smooth boundary.

Btn2—14 to 18 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium and coarse prismatic structure parting to strong fine and medium angular blocky; extremely hard, very firm, very sticky and very plastic; common very fine roots along faces of peds; many very fine pores; many faint clay films on faces of peds; very dark brown (10YR 2/2) coatings on faces of peds; moderately alkaline; clear smooth boundary.

Bky1—18 to 26 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; strong fine and medium angular and subangular blocky structure; very hard, very firm, very sticky and very plastic; common very fine roots; many very fine pores; few faint clay films on faces of peds; very dark grayish brown (10YR 3/2) coatings on faces of peds; few fine gypsum crystals; common fine and medium irregularly shaped masses of lime; strong effervescence; strongly alkaline; clear smooth boundary.

Bky2—26 to 32 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; common very fine roots; common very fine pores; common fine and medium gypsum crystals; common fine and medium irregularly shaped masses of lime; violent effervescence; strongly alkaline; clear smooth boundary.

BCk—32 to 47 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; many very fine pores; common fine threads of lime; violent effervescence; moderately alkaline; clear wavy boundary.

C—47 to 60 inches; light yellowish brown (2.5Y 6/4) clay, light olive brown (2.5Y 5/4) moist; common fine distinct brownish yellow (10YR 6/8) dry redoximorphic

concentrations; weak medium and coarse subangular blocky structure; extremely hard, very firm, very sticky and very plastic; few very fine roots; common very fine pores; few fine gypsum crystals; common fine irregularly shaped masses of lime; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to gypsum or other salts: 16 to 36 inches

A horizon:
Value: 4 or 5, 2 or 3 moist
Texture: silt loam or loam

E horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 to 5 moist
Chroma: 1 or 2
Texture: silt loam or loam
Notes: Some cultivated pedons do not have an E horizon.

Btn horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 or 3
Texture: clay loam, silty clay loam, clay, or silty clay

Bk horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 or 3
Texture: clay, clay loam, or silty clay
Notes: Some pedons have Byz, By, or Bz horizons up to 10 inches thick.

BC and C horizons:
Hue: 2.5Y or 5Y
Value: 5 to 7, 3 to 6 moist
Chroma: 1 to 4
Texture: Clay loam, clay, silty clay, or silty clay loam

Desart Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Alluvial flats and alluvial fans
Parent material: Alluvium
Slope: 0 to 6 percent
Notes: These soils are sodic.

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Typic Natrustolls

Typical pedon:
Desart fine sandy loam, 1,300 feet west and 300 feet south of the northeast corner of sec. 28, T. 131 N., R. 81 W. (Colors are for dry soil unless otherwise stated.)

A1—0 to 11 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine roots; slightly acid; clear smooth boundary.

A2—11 to 20 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine roots; neutral; clear smooth boundary.

E—20 to 24 inches; light brownish gray (2.5Y 6/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure parting to weak coarse platy; soft, very friable, nonsticky and nonplastic; common very fine roots; slightly alkaline; abrupt wavy boundary.

Btn—24 to 31 inches; light yellowish brown (2.5Y 6/3) fine sandy loam, olive brown (2.5Y 4/3) moist; strong coarse columnar structure parting to weak coarse platy; very hard, firm, slightly sticky and slightly plastic; few very fine roots; common faint dark grayish brown (2.5Y 4/2) moist clay films on faces of peds; strongly alkaline; clear wavy boundary.

C—31 to 60 inches; light brownish gray (2.5Y 6/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, very friable, nonsticky and nonplastic; strongly alkaline.

Range in Characteristics

Depth to the Btn horizon: 20 to 30 inches
Notes: Some pedons have E/B, B/E, Bk, Bky, or BCk horizons.

A horizon:
Value: 2 or 3 moist
Chroma: 2 or 3
Texture: fine sandy loam, very fine sandy loam, or sandy loam

E horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 3 to 5 moist
Chroma: 1 or 2
Texture: very fine sandy loam, loamy fine sand, fine sandy loam, sandy loam, loamy sand, or fine sand

Btn horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 or 6, 3 to 5 moist
Chroma: 2 or 3
Texture: fine sandy loam, very fine sandy loam, sandy loam, or loam
Notes: Carbonates and salts are in the lower part in some pedons.

C horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 or 3
Texture: loam, sandy loam, or loamy fine sand

Dimmick Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Very slow
Landform: Depressions
Parent material: Alluvium
Slope: 0 to 1 percent

Taxonomic class: Fine, smectitic, frigid Vertic Epiaquolls

Typical pedon:
Dimmick silty clay loam, 1,056 feet south and 180 feet east of the northwest corner of sec. 11, T. 144 N., R. 95 W. (Colors are for moist soil unless otherwise stated.)

Oe—0 to 3 inches; roots and partly decomposed stems and leaves of plants; loose; abrupt smooth boundary.

A—3 to 6 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; many very fine distinct dark yellowish brown (10YR 4/4) redoximorphic accumulations; strong fine and very fine angular blocky structure; hard, firm, very sticky and very plastic; many fine and medium roots; neutral; gradual wavy boundary.

Ag—6 to 23 inches; very dark gray (5Y 3/1) silty clay loam, gray (5Y 5/1) dry; many medium prominent dark yellowish brown (10YR 4/4) redoximorphic accumulations; weak fine angular blocky structure; hard, very firm, very sticky and very plastic; common fine and few medium roots; neutral; gradual smooth boundary.

BCg—23 to 43 inches; dark gray (5Y 4/1) clay, gray (5Y 6/1) dry; many medium prominent olive brown (2.5Y 4/4) redoximorphic accumulations; weak fine subangular blocky structure; hard, very firm, very sticky and very plastic; few roots; neutral; diffuse wavy boundary.

Cg—43 to 63 inches; dark gray (N 4/0) clay, gray (N 6/0) dry; many coarse prominent olive brown (2.5Y 4/4) redoximorphic accumulations; massive; hard, very firm, very sticky and very plastic; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to more than 40 inches
Depth to lime: 20 to more than 40 inches
Notes: Some pedons have Bk horizons. Some pedons have strata of silty clay loam or sandy clay loam below the A horizon.

A horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 2 or 3, 4 or 5 dry
Chroma: 2 or less

C horizon:
Hue: 2.5Y, 5Y, or neutral
Value: 4 to 8
Chroma: 0 to 3
Texture: clay or silty clay
Notes: Some pedons are loam, silt loam, or silty clay loam below 40 inches.

Divide Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part and very rapid in the lower part
Landform: Flat
Parent material: Glacial till
Slope: 0 to 3 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aeric Calciaquolls

Typical pedon:
Divide loam, 1,050 feet west and 315 feet south of the northeast corner of sec. 4, T. 149 N., R. 60 W. (Colors are for moist soil unless otherwise stated.)

Ap—0 to 8 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; about 5 percent gravel; strong effervescence; moderately alkaline; abrupt smooth boundary.

Ak—8 to 12 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; about 5 percent gravel; few fine masses of lime; violent effervescence; moderately alkaline; abrupt wavy boundary.

Bk—12 to 22 inches; light brownish gray (2.5Y 6/2) loam, light gray (2.5Y 7/2) dry; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots; about 5 percent gravel; common medium masses of lime; violent effervescence; moderately alkaline; clear smooth boundary.

2C1—22 to 26 inches; light olive brown (2.5Y 5/4) gravelly loamy coarse sand, light yellowish brown (2.5Y 6/4) dry; single grain; loose, nonsticky and nonplastic; few fine roots; about 20 percent gravel; strong effervescence; moderately alkaline; clear smooth boundary.

2C2—26 to 60 inches; olive brown (2.5Y 4/4) very gravelly coarse sand, light olive brown (2.5Y 5/4) dry; single grain; loose, nonsticky and nonplastic; about 35 percent gravel; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 20 inches
Depth to the calcic horizon: 7 to 16 inches
Depth to sand and gravel: 20 to 40 inches
Notes: Some pedons have an ABk horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 2 or 3, 3 to 5 dry

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 8 dry
Chroma: 1 to 4

2C horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 5 to 7 dry
Notes: It has 5 to 40 percent gravel.

Dogtooth Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Landform: Pediments, divides, hills, and ridges

Parent material: Residuum
Slope: 0 to 25 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Leptic Natrustolls

Typical pedon:
Dogtooth silt loam, 2,100 feet east and 1,350 feet south of the northwest corner of sec. 4, T. 140 N., R. 89 W. (Colors are for dry soil unless otherwise stated.)

E—0 to 2 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; common fine pores; neutral; abrupt smooth boundary.

Btn—2 to 8 inches; grayish brown (2.5Y 5/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; strong medium columnar structure parting to moderate fine angular blocky; very hard, very firm, very sticky and very plastic; common fine roots between peds; few medium and common fine pores; column tops coated with light brownish gray (2.5Y 6/2) dry E material; many distinct dark grayish brown (2.5Y 4/2) dry clay films on faces of peds; slight effervescence in lower part; moderately alkaline; clear smooth boundary.

Btkn—8 to 13 inches; light yellowish brown (2.5Y 6/4) silty clay, light olive brown (2.5Y 5/4) moist; moderate medium prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; few fine roots; common fine pores; many faint clay films on faces of peds; few fine irregular masses of lime; strong effervescence; moderately alkaline; clear smooth boundary.

Bky—13 to 21 inches; light yellowish brown (2.5Y 6/4) silty clay, light olive brown (2.5Y 5/4) moist; moderate medium prismatic structure parting to moderate fine angular blocky; very hard, very firm, very sticky and very plastic; few fine roots; few fine pores; common fine irregular masses of lime; few fine gypsum crystals; strong effervescence; strongly alkaline; abrupt wavy boundary.

Cr—21 to 60 inches; light gray (5Y 6/1) soft shale bedrock, dark gray (5Y 4/1) moist; slight effervescence.

Range in Characteristics

Depth to gypsum or other salts: 5 to 14 inches
Depth to soft bedrock: 20 to 40 inches

E horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 or 4 moist
Chroma: 2 or 3
Texture: loam, silt loam, or silty clay loam

Btn horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 1 to 3
Texture: silty clay, clay, silty clay loam, or clay loam

Btkn horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 or 6, 3 to 5 moist

Chroma: 1 to 4
Texture: clay, silty clay, silty clay loam, or clay loam

Bky horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 or 5 moist
Chroma: 1 to 4
Texture: silty clay, silty clay loam, clay loam, or loam

Cr horizon:
Notes: It is soft shale, siltstone, or mudstone bedrock.

Dooley Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part and slow in the lower part
Landform: Till plains
Parent material: Eolian over glacial till
Slope: 0 to 15 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Dooley fine sandy loam, 1,320 feet south and 75 feet west of the northeast corner of sec. 33, T. 32 N., R. 58 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches, dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine crumb structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; 1 percent pebbles; neutral (pH 6.8); clear smooth boundary.

Bt—6 to 15 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure; hard, very friable, sticky and plastic; thin continuous clay film on faces of peds and clay bridging between sand grains; many very fine roots; many very fine tubular pores; 3 percent pebbles; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk—15 to 24 inches; grayish brown (2.5Y 5/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure; hard, very friable, nonsticky and nonplastic; many very fine vertical roots; many very fine tubular pores; 10 percent pebbles; disseminated lime and common fine masses of lime; lime casts on underside of pebbles; strong effervescence; moderately alkaline (pH 8.2); clear wavy boundary.

2BCk—24 to 36 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; 10 percent pebbles; small masses of lime and lime casts on underside of pebbles; violent effervescence; moderately alkaline (pH 8.4); gradual wavy boundary.

2C—36 to 60 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium platy; hard, friable, very sticky and very plastic; few roots; few pores; 10 percent pebbles and 1 percent stones; disseminated lime; violent effervescence; moderately alkaline (pH 8.4)

Range in Characteristics

Mollic epipedon thickness: 7 to 15 inches
Depth to lime: 20 to 26 inches
Depth to glacial till: 23 to 39 inches

Ap horizon:
Value: 3 or 4, 2 or 3 moist
Texture: fine sandy loam or sandy loam

Bk horizon:
Texture: sandy loam or sandy clay loam
Notes: Some pedons do not have a Bk horizon above the till.

2BCk horizon:
Value: 5 to 7, 4 or 5 moist
Chroma: 2 or 3
Texture: clay loam or loam

Dovray Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Very slow
Landform: Lake plains
Parent material: Glaciolacustrine deposits
Slope: 0 to 1 percent

Taxonomic class: Fine, smectitic, frigid Cumulic Vertic Epiaquolls

Typical pedon:
Dovray clay, 900 feet south and 25 feet west of the northeast corner of sec. 22, T. 118 N., R. 43 W. (Colors are for moist soil unless otherwise stated.)

Ap—0 to 10 inches; black (N 2/0), broken face, clay; moderate fine subangular blocky structure; hard; slightly alkaline; clear smooth boundary.

A—10 to 33 inches; black (N 2/0), broken face, clay; moderate very fine angular blocky structure; firm; few gypsum crystals pedogenic at top of horizon; few fine distinct dark yellowish brown (10YR 4/4) redoximorphic concentrations; neutral; gradual smooth boundary.

ABg—33 to 43 inches; very dark gray (5Y 3/1), broken face, clay; moderate very fine angular blocky structure; firm; neutral; gradual smooth boundary.

Bg—43 to 56 inches; olive gray (5Y 5/2), broken face, clay; moderate fine subangular blocky structure; firm; many medium prominent dark yellowish brown (10YR 4/4) and many medium prominent brown (7.5YR 4/4) redoximorphic concentrations; neutral; clear smooth boundary.

Cg—56 to 60 inches; light olive gray (5Y 6/2) clay; massive; firm; few lime threads pedogenic throughout; many fine prominent dark yellowish brown (10YR 4/4) redoximorphic concentrations; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 24 to 54 inches
Depth to lime: 20 to 60 inches
Notes: Some pedons have an 0 horizon up to 4 inches thick.

Ekalaka Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Alluvial flats, hills, ridges, and alluvial fans
Parent material: Alluvium
Slope: 0 to 15 percent
Notes: These soils are sodic.

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Typic Natrustolls

Typical pedon:
Ekalaka fine sandy loam, 2,110 feet east and 1,300 feet north of the southwest corner of sec. 15, T. 133 N., R. 83 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; few medium and common fine and very fine roots throughout; strongly acid; clear smooth boundary.

E—6 to 12 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak very thin platy structure; soft, very friable, nonsticky and nonplastic; many very fine roots; slightly acid; abrupt wavy boundary.

Btn—12 to 17 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; strong coarse columnar structure parting to strong medium angular blocky; extremely hard, firm, nonsticky and slightly plastic; common fine and many very fine roots between peds; clay bridging between sand grains and light gray (10YR 7/2) sand coats on faces of peds (10YR 4/2) moist; neutral; gradual wavy boundary.

Bz1—17 to 21 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, friable, nonsticky and slightly plastic; common very fine roots between peds; many threads and masses of salt; slight effervescence; slightly alkaline; gradual wavy boundary.

Bz2—21 to 25 inches; pale brown (10YR 6/3) loamy fine sand, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; very hard, friable, nonsticky and nonplastic; few very fine roots; few masses of salt; slight effervescence; slightly alkaline; clear wavy boundary.

BCz—25 to 33 inches; grayish brown (2.5Y 5/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, nonsticky and nonplastic; few very fine roots throughout; few salt masses; many coarse yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) masses of manganese; slight effervescence; slightly alkaline; gradual wavy boundary.

C—33 to 60 inches; light gray (5Y 7/2) stratified fine sandy loam, loamy sand and sand, olive gray (5Y 4/2) moist; massive; hard, friable, nonsticky and nonplastic; few very fine roots throughout; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 25 inches
Depth to the Btn horizon: 7 to 20 inches

Notes: Some pedons have a Bk horizon. Some pedons have a Cr horizon at a depth of 40 to 60 inches.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Texture: fine sandy loam or loam

E horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 3 to 5 moist
Chroma: 1 to 3
Texture: loamy fine sand, fine sandy loam, or very fine sandy loam
Notes: Some cultivated pedons do not have an E horizon.

Btn horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: sandy loam, fine sandy loam, or loam
Notes: It has lime or salts in the lower part in some pedons.

Bz horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 3 to 6 moist
Chroma: 2 to 4
Texture: fine sandy loam, loamy fine sand, fine sand, or sandy loam

C horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: stratified fine sandy loam, loamy fine sand, fine sand or sandy loam

Ethridge Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Alluvial flats, hills, ridges, stream terraces, and alluvial fans
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Fine, smectitic, frigid Torrertic Argiustolls

Typical pedon:
Ethridge silt loam, 1,550 feet east and 300 feet north of the southwest corner of sec. 36, T. 139 N., R. 101 W. (Color are for dry soil unless otherwise stated.) (fig. 20)

A—0 to 3 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine pores; neutral; clear smooth boundary.

Bt—3 to 10 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, friable, sticky and plastic; common very

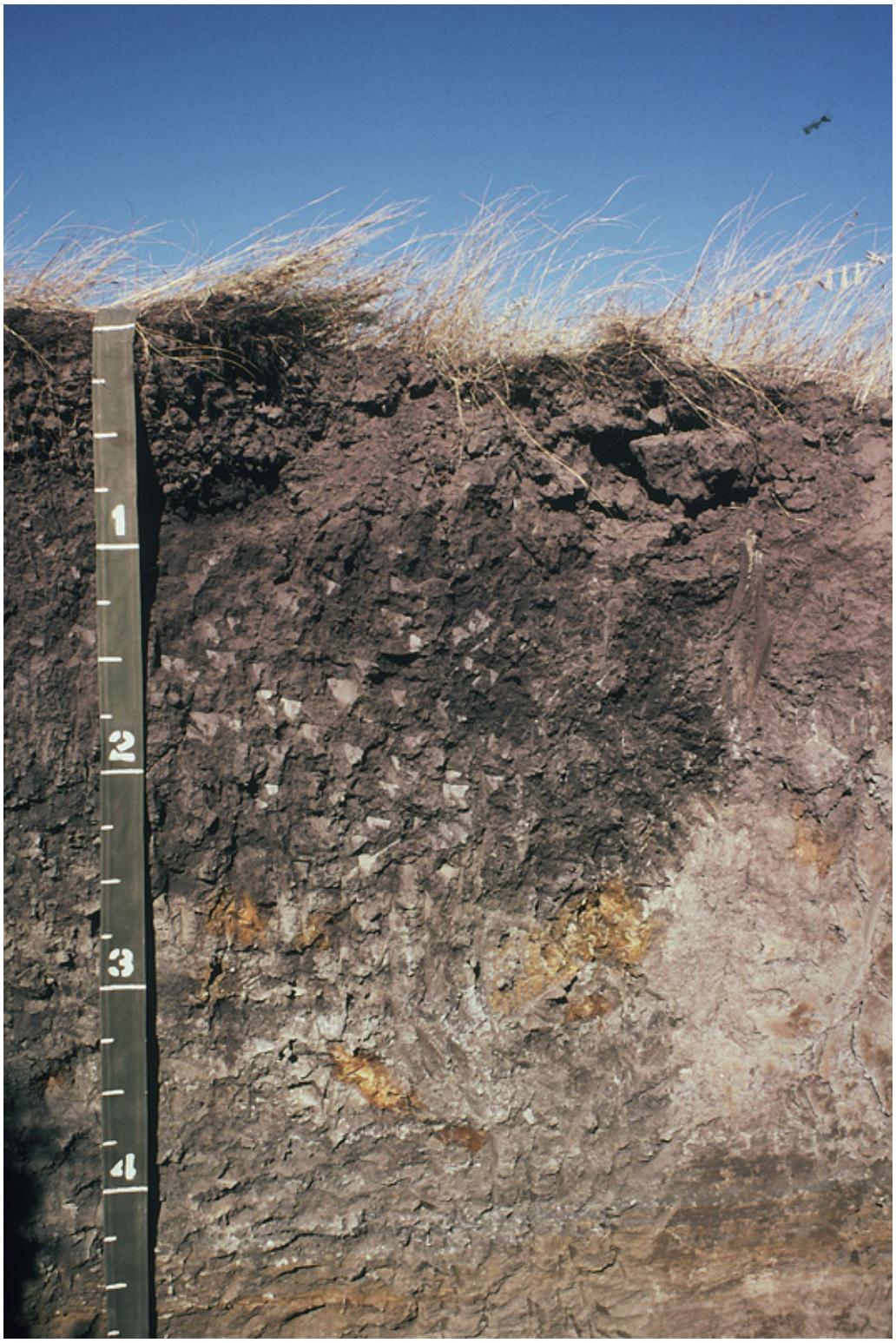


Figure 20. Typical profile of Ethridge silt loam.

fine roots; many very fine pores; many distinct clay films on faces of peds; neutral; clear wavy boundary.

Btk1—10 to 13 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, friable, sticky and plastic; common very fine roots; many very fine pores; many distinct clay films on faces of peds; strong effervescence; moderately alkaline; clear wavy boundary.

Btk2—13 to 23 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, friable, sticky and plastic; common very fine roots; many very fine pores; common distinct clay films on faces of peds; common fine rounded masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

Bk—23 to 38 inches; very pale brown (10YR 7/3) silty clay loam, brown (10YR 5/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, friable, sticky and plastic; few very fine roots; common very fine pores; common fine rounded masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

Bky—38 to 53 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few very fine pores; common fine rounded nests of gypsum; common fine rounded masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

BC—53 to 60 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine rounded masses of lime; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 14 inches
Depth to the Bk horizon: 10 to 20 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 2 or 3 moist
Chroma: 2 or 3
Texture: silt loam or loam

Bt horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4
Texture: silty clay loam, silty clay, or clay

Btk horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 2 to 4
Texture: silty clay loam, clay, or silty clay

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: silty clay loam, clay loam, or clay

Bky and BC horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: silt loam, clay loam, or silty clay loam

Farland Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Alluvial flats and alluvial fans
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Farland silt loam, 1,490 feet north and 1,200 feet west of southeast corner of sec. 1, T. 139 N., R. 91 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak medium and fine prismatic and fine subangular blocky structure parting to moderate fine granular; slightly hard, friable; many roots; many fine pores; neutral; gradual wavy boundary.

Bt1—4 to 11 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine prismatic structure parting to strong medium and fine angular blocky; hard, friable; many roots; common fine pores; faint clay films on faces of peds; neutral; clear wavy boundary.

Bt2—11 to 18 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and fine prismatic structure parting to strong medium and fine subangular blocky; hard, friable; common roots; common fine pores; faint patchy clay films; neutral; gradual wavy boundary.

Bk1—18 to 25 inches; light yellowish brown (2.5Y 6/4) silt loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic and moderate coarse subangular blocky structure; hard, friable; few roots; common fine pores; strong effervescence; slightly alkaline; clear wavy boundary.

Bk2—25 to 34 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; weak coarse prismatic and moderate coarse and medium subangular blocky structure; friable; few roots; few fine pores; violent effervescence; common coarse masses of lime; moderately alkaline; gradual boundary.

C—34 to 60 inches; light brownish gray (2.5Y 6/2) stratified silt loam, loam, and silty clay loam, olive brown (2.5Y 4/4) moist; weak coarse to fine subangular blocky structure parting to weak thin platy; friable; few roots; few fine pores; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 8 to 30 inches
Notes: Some pedons have a Btk or BCk horizon.

A horizon:
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3

Bt horizon:
Value: 4 to 6
Chroma: 2 to 4
Texture: silty clay loam or clay loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 3 to 5 moist
Chroma: 2 to 4
Texture: loam, silt loam, or silty clay loam

C horizon:
Hue: 2.5Y or 5Y
Value: 4 to 6
Chroma: 2 to 4

Farnuf Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Alluvial flats, ridges, hills, divides, alluvial fans, and stream terraces
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Farnuf loam, 2,000 feet west and 2,200 feet north of the southeast corner of sec. 25, T. 137 N., R. 73 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure parting to moderate fine granular; soft, friable, slightly sticky and slightly plastic; many fine and medium roots; many very fine and fine tubular and vesicular pores; neutral; clear smooth boundary.

Bt1—9 to 15 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, sticky and plastic; common fine and medium roots; many fine and medium tubular and vesicular pores; very few patchy faint dark grayish brown (10YR 4/2) clay films on faces of peds; slightly alkaline; clear wavy boundary.

Bt2—15 to 23 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, sticky and plastic; common fine and medium roots; many fine and very fine vesicular and tubular pores; very few patchy faint dark grayish brown (10YR 4/2) clay films on faces of peds; slightly alkaline; clear wavy boundary.

Bk—23 to 34 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to weak medium and fine

subangular blocky; hard, friable, sticky and plastic; common fine and medium roots; many fine and very fine vesicular and tubular pores; common fine masses of lime; violent effervescence; moderately alkaline; diffuse wavy boundary.

C—34 to 60 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 4/2) moist; massive; hard, friable, sticky and plastic; common fine and very fine vesicular and tubular pores; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 15 inches

Ap horizon:
Value: 4 or 5, 2 or 3 moist

Bt horizon:
Chroma: 2 to 4 moist

Bk horizon:
Value: 5 to 7, 4 to 6 moist
Texture: loam, clay loam, or silty clay loam

C horizon:
Value: 5 to 7, 4 to 6 moist
Texture: loam, silt loam, silty clay loam, or clay loam

Felor Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over slow
Landform: Divides
Parent material: Alluvium
Slope: 6 to 9 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Felor loam, 282 feet east and 72 feet south of the northwest corner of sec. 23, T. 18 N., R. 15 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 5 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak very coarse subangular blocky and weak fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; few pebbles; many fine and medium roots; slightly acid; abrupt wavy boundary.

A—5 to 11 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; slightly acid; clear wavy boundary.

Bt—11 to 28 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate fine prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, slightly sticky and plastic; few fine roots; few pebbles; shiny film on faces of peds; slightly acid; gradual wavy boundary.

2Bw—28 to 34 inches; pale yellow (5Y 7/3) silty clay, pale olive (5Y 6/3) moist; strong fine and medium prismatic structure parting to moderate fine and medium blocky;

hard, firm, sticky and plastic; shiny film on faces of peds; few fine roots; slightly alkaline; abrupt wavy boundary.

2Bk—34 to 39 inches; light brown (7.5YR 6/4) and pale yellow (5Y 7/3) silty clay, brown (7.5YR 5/4) and pale olive (5Y 6/3) moist; moderate fine and medium prismatic structure parting to weak medium subangular blocky; hard, firm, sticky and plastic; common fine and medium accumulations of lime; strong effervescence; moderately alkaline; abrupt wavy boundary.

2C—39 to 60 inches; white (2.5Y 8/2) and light reddish brown (5YR 6/3) silty clay, reddish brown (5Y 5/3) and light brownish gray (2.5Y 6/2) moist; few fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; massive; laminated; hard, firm, sticky and plastic; few fine accumulations of lime; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to clayey material: 20 to 35 inches

A horizon:
Value: 4 or 5, 2 or 3 moist

Bt horizon:
Hue: 7.5YR, 10YR, or 2.5Y
Value: 4 to 7, 3 to 6 moist
Chroma: 2 to 4
Texture: clay loam or sandy clay loam

2Bk horizon:
Value: 5 to 8, 4 to 6 moist
Chroma: 2 to 4
Notes: Some pedons have a Bk horizon.

2C horizon:
Value: 5 to 8, 4 to 6 moist

Flasher Series

Depth class: Shallow
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Hills, pediments, and ridges
Parent material: Residuum
Slope: 3 to 70 percent

Taxonomic class: Mixed, frigid, shallow Typic Ustipsamments

Typical pedon:
Flasher loamy fine sand, 1,110 feet north and 195 feet west of southeast corner of sec. 3, T. 134 N., R. 86 W. (Colors are for dry soil unless otherwise stated.) (fig. 21)

A—0 to 6 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; very friable, nonsticky and nonplastic; many roots; quartz grains stained; slight effervescence; slightly alkaline; gradual wavy boundary.

AC—6 to 10 inches; light olive brown (2.5Y 5/4) loamy fine sand, olive brown (2.5Y 4/4) moist; weak fine subangular blocky structure; loose, nonsticky and

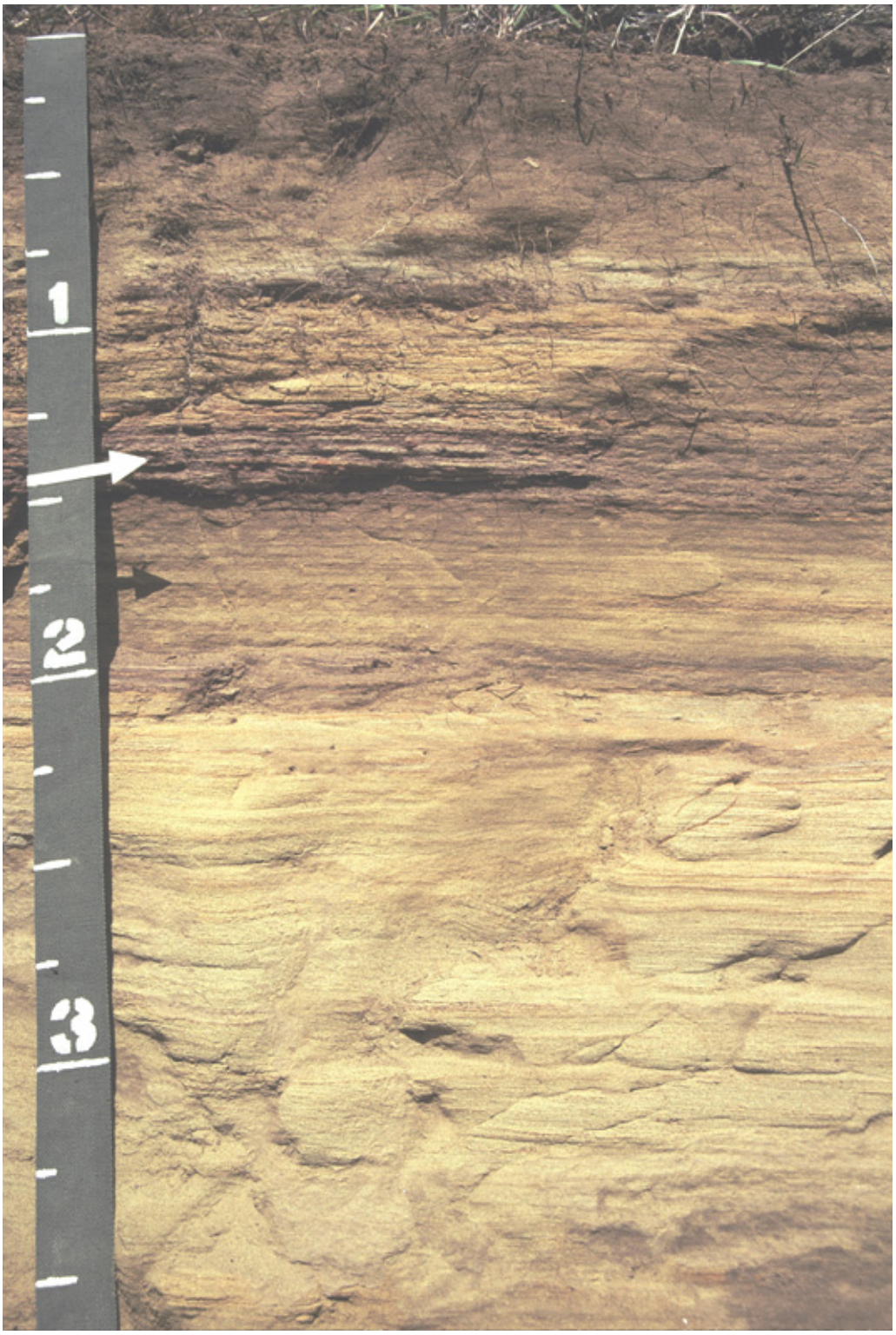


Figure 21. Typical profile of Flasher loamy fine sand.

nonplastic; common roots; few small hard sandstone fragments; slight effervescence; slightly alkaline; gradual smooth boundary.

Cr—10 to 60 inches; light yellowish brown (2.5Y 6/4) soft sandstone that crushes to sand, olive brown (2.5Y 4/4) and light olive brown (2.5Y 5/4) moist; slight effervescence; moderately alkaline.

Range in Characteristics

Particle-size control section: loamy fine sand, fine sand, loamy sand, or sand
Depth to soft bedrock: 7 to 20 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 2 to 4 moist
Chroma: 2 or 3
Texture: loamy fine sand or loamy sand

AC horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 8, 3 to 6 moist
Chroma: 2 to 4
Texture: loamy fine sand, fine sand, or loamy sand

Cr horizon:
Notes: It is soft sandstone bedrock that crushes to fine sand, sand, or loamy fine sand.

Flaxton Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid in the upper part and moderately slow in the lower part
Landform: Till plains
Parent material: Eolian and glacial till
Slope: 3 to 15 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Pachic Argiustolls

Typical pedon:
Flaxton fine sandy loam, 190 feet south of the northeast corner of sec. 24, T. 137 N., R. 79 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 15 inches; very dark grayish brown (10YR 3/2) fine sandy loam, very dark brown (10YR 2/2) moist; dark grayish brown (10YR 4/2) dry in upper 2 inches; weak coarse and medium prismatic structure parting to weak fine subangular blocky and granular; friable; many roots; neutral; gradual smooth boundary.

Bw—15 to 22 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; friable; common roots; thin very dark brown (10YR 2/2) stains on faces of prisms; neutral; clear wavy boundary.

2Bt1—22 to 25 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure; firm, sticky; few fine and medium roots; many thin very dark grayish brown (2.5Y 3/2) clay films on faces of peds; few stones and pebbles; slightly alkaline; clear wavy boundary.

2Bt2—25 to 30 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse and medium prismatic structure; firm; few roots; many thin very dark grayish brown (2.5Y 3/2) clay films on faces of prisms; few tongues of fine sandy loam extend through the Bt horizons; strong effervescence; interior of prisms have a few masses of lime; slightly alkaline; clear wavy boundary.

2Bw—30 to 35 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse and medium prismatic structure; firm; strong effervescence; few masses of lime; moderately alkaline; gradual wavy boundary.

2Bk—35 to 42 inches; light brownish gray (2.5Y 6/2) clay loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure; firm; strong effervescence; many large masses of lime; moderately alkaline; gradual wavy boundary.

2BCk—42 to 60 inches; pale olive (5Y 6/3) clay loam, olive (5Y 4/3) moist; massive; firm; violent effervescence; many masses of lime; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to more than 30 inches
Depth to glacial till: 12 to 30 inches
Notes: Some pedons do not have a Bw or 2BCk horizon.

A horizon:
Value: 3 or 4, 2 or 3 moist

2Bt horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 2 to 4
Texture: clay loam or loam

2Bk horizon:
Value: 5 or 6, 4 or 5 moist

2BCk horizon:
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4

Fleak Series

Depth class: Shallow
Drainage class: Excessively drained
Permeability: Rapid
Landform: Ridges and hills
Parent material: Residuum
Slope: 6 to 70 percent

Taxonomic class: Mixed, frigid, shallow Aridic Ustipsamments

Typical pedon:
Fleak loamy fine sand, 1,790 feet east and 1,580 feet south of the northwest corner of sec. 30, T. 129 N., R. 106 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; grayish brown (10YR 5/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; very weak fine granular structure; loose; many matted roots; neutral; clear wavy boundary.

C1—3 to 8 inches; grayish brown (2.5Y 5/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; many roots; slight effervescence; slightly alkaline; gradual smooth boundary.

C2—8 to 17 inches; light brownish gray (2.5Y 6/2) loamy fine sand, grayish brown (2.5Y 5/2) moist; single grain; common to few roots; slight effervescence; slightly alkaline; clear wavy boundary

Cr—17 to 40 inches; pale yellow (2.5Y 7/3) soft layered sandstone, light olive brown (2.5Y 5/3) moist; hard, brittle, dry, very friable moist; a few roots in upper 8 inches; slight effervescence.

Range in Characteristics

Depth to lime: 0 to 6 inches
Depth to soft bedrock: 7 to 20 inches

A horizon:
Hue: 10YR, 7.5YR, or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 or 3

C horizon:
Hue: 10YR or 2.5Y
Chroma: 2 to 4
Texture: fine sand or loamy fine sand

Cr horizon:
Notes: In some pedons fragments of hard sandstone are in the soft sandstone.

Floweree Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Terraces, alluvial fans, or sedimentary hills
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Floweree silt loam, 700 west and 1,250 feet south of the northeast corner of sec. 3, T. 146 N., R. 102 W. (Colors are for dry soil unless otherwise stated.)

A1—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to weak fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine pores; slightly alkaline; clear smooth boundary.

A2—3 to 5 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine pores; slightly alkaline; clear wavy boundary.

Bw—5 to 11 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate

medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; slightly alkaline; clear wavy boundary.

Bk1—11 to 21 inches; light olive brown (2.5Y 5/3) silt loam, olive brown (2.5Y 4/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; few fine irregularly-shaped masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—21 to 35 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak coarse prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine pores; few fine irregularly-shaped masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.

BCk—35 to 58 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; weak coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine pores; common fine irregularly-shaped masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.

C—58 to 80 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine pores; few fine irregularly-shaped masses of lime; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to Bk horizon: 11 to 25 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3

Bw horizon
Hue: 10YR or 2.5Y
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam

Bk and BCk horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam

C horizon:
Hue: 10YR or 2.5Y
Value: 6 or 7 dry 4 or 5 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam

Gerda Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Very slow
Landform: Alluvial fans, hills, ridges, and alluvial flats
Parent material: Alluvium
Slope: 0 to 9 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Leptic Torrertic Natrustolls

Typical pedon:
Gerda loam, 590 feet north and 710 feet west of the southeast corner of sec. 29, T. 137 N., R. 100 W. (Colors are for dry soil unless otherwise stated.)

E—0 to 2 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and thick platy structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine and fine tubular pores; neutral; abrupt wavy boundary.

Btn—2 to 11 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; moderate coarse columnar structure parting to strong medium subangular blocky; extremely hard, extremely firm, sticky and plastic; common very fine roots between peds; common very fine tubular pores; many continuous prominent clay films on faces of peds and in pores; moderately alkaline; clear wavy boundary.

Btkny—11 to 19 inches; light olive brown (2.5Y 5/3) silty clay, olive brown (2.5Y 4/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; common very fine roots between peds; common very fine tubular pores; common discontinuous distinct clay films on vertical and horizontal faces of peds; common fine irregular masses of gypsum; common fine irregular masses of lime; violent effervescence; strongly alkaline; gradual wavy boundary.

Bky—19 to 29 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; common fine irregular masses of gypsum; common fine irregular masses of lime; violent effervescence; strongly alkaline; gradual wavy boundary.

Bk—29 to 44 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine tubular pores; common fine irregular masses of lime; violent effervescence; strongly alkaline; gradual wavy boundary.

C—44 to 80 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; strong effervescence; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to gypsum or other salts: 5 to 16 inches
Notes: Some uncultivated pedons have a thin A horizon.

E horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 3 or 4 moist
Chroma: 2 or 3
Texture: loam or silt loam

Btn horizon:
Hue: 2.5Y or 10YR
Value: 4 or 5
Chroma: 2 or 3
Texture: silty clay, clay, silty clay loam, or clay loam

Btnky horizon:
Hue: 2.5Y, 5Y, or 10YR
Value: 5 or 7, 4 or 5 moist
Chroma: 2 to 4
Texture: silty clay, silty clay loam, clay loam, or clay

Bky and Bk horizons:
Hue: 2.5Y or 5Y
Chroma: 2 or 3
Texture: silty clay loam, clay loam, or silty clay

C horizon:
Hue: 2.5Y, 5Y, or 10YR
Value: 6 or 7, 4 or 5 moist
Chroma: 2 to 4
Texture: silt loam, loam, or sandy loam

Glendive Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 6 percent
Notes: These soils are calcareous.

Taxonomic class: Coarse-loamy, mixed, superactive, calcareous, frigid Aridic Ustifluvents

Typical pedon:
Glendive fine sandy loam, 1,920 feet west and 2,540 feet south of the northeast corner of sec. 34, T. 21 N., R. 2 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; very hard, friable, slightly sticky and plastic; many very fine roots; strong effervescence; moderately alkaline; clear smooth boundary.

C1—5 to 10 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; very hard, friable, sticky and plastic; many very fine roots; many very fine pores; strong effervescence; moderately alkaline; gradual smooth boundary.

C2—10 to 16 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine pores; strong effervescence; strongly alkaline; gradual smooth boundary.

C3—16 to 60 inches; light brownish gray (10YR 6/2) fine sandy loam that consists of thin layers of loam, sandy loam and loamy fine sand, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots grading to few in lower part; common fine pores; strong effervescence; strongly alkaline.

Range in Characteristics

Ap horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 or 3
Texture: fine sandy loam or sandy loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam, silt loam, fine sandy loam, or sandy loam
Notes: It has thin layers of loam, sandy loam, silt loam, loamy sand, or loamy fine sand in the lower part.

Golva Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Alluvial flats, alluvial fans, hills, ridges, and knolls
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Golva silt loam, 1,630 feet north and 2,000 feet west of the southeast corner of sec. 36, T. 133 N., R. 104 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to moderate medium granular; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; neutral; gradual wavy boundary.

Bw1—5 to 15 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate coarse and medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; slightly alkaline; gradual wavy boundary.

Bw2—15 to 21 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; strong effervescence; moderately alkaline; clear wavy boundary.

Bk1—21 to 32 inches; pale yellow (2.5Y 7/4) silt loam, olive brown (2.5Y 4/4) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; discontinuous thin pebble line at bottom of horizon; common masses of carbonates; violent effervescence; moderately alkaline; clear smooth boundary.

Bk2—32 to 40 inches; pale yellow (5Y 8/3) silt loam, olive (5Y 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common masses of carbonates; violent effervescence; moderately alkaline; abrupt wavy boundary.

C—40 to 60 inches; pale yellow (5Y 8/3) silt loam, olive (5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 10 to 22 inches
10 to 40 inch particle-size control section: 18 to 30 percent clay
Notes: The depth to siltstone or silty shale is greater than 40 inches.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Texture: silt loam or loam

Bw horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 or 3
Texture: silt loam or silty clay loam
Notes: In some pedons the Bw1 horizon contains carbonates.

Bk horizon:
Hue: 2.5Y or 5Y
Value: 6 to 8, 4 to 6 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 8, 4 to 6 moist
Chroma: 2 to 4
Texture: silt loam, silty clay loam, or loam
Notes: Some pedons have sandy loam or silty clay material between 40 and 60 inches depth.

Grail Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Swales and alluvial flats
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine, smectitic, frigid Pachic Vertic Argiustolls

Typical pedon:
Grail silty clay loam, 900 feet west and 900 feet south of the center of sec. 18, T. 139 N., R. 91 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; weak coarse and medium subangular blocky structure; soft, friable; many roots; many pores; neutral; abrupt smooth boundary.

A—5 to 10 inches; dark gray (10YR 4/1) silty clay loam, very dark brown (10YR 2/2) moist; weak medium prismatic structure parting to moderate coarse and medium subangular blocky; slightly hard, friable; many roots; many pores; neutral; gradual wavy boundary.

Bt1—10 to 13 inches; dark gray (10YR 4/1) silty clay loam, very dark brown (10YR 2/2) moist; weak medium prismatic structure parting to moderate coarse and medium subangular blocky and moderate fine granular; firm; common roots; few pores; faint clay films on faces of prisms and blocks; neutral; gradual smooth boundary.

Bt2—13 to 24 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to strong medium and fine angular blocky; very hard, firm; few roots; few pores; clay films on faces of peds; neutral; clear wavy boundary.

Bk—24 to 52 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; very weak medium prismatic structure parting to moderate coarse and medium subangular blocky; hard, firm; few pores; strong effervescence; few small masses of lime; moderately alkaline; clear wavy boundary.

C—52 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, firm; strong effervescence; few small masses of lime; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to more than 40 inches
Notes: Some pedons have an AB, Btk, or BCk horizon.

Ap horizon:
Value: 3 or 4, 2 or 3 moist

Bt horizon:
Value: 3 to 5, 2 to 4 moist
Chroma: 1 to 3

Bk horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 to 5 moist
Chroma: 3 to 4

Grano Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Slow
Landform: Lake plains
Parent material: Glaciolacustrine deposits

Slope: 0 to 1 percent
Notes: These soils are calcareous.

Taxonomic class: Fine, smectitic, frigid Typic Endoaquerts

Typical pedon:
Grano silty clay, 1,790 feet north and 90 feet east of the southwest corner of sec. 26, T. 135 N., R. 66 W. (Colors are for dry soil unless otherwise stated.)

Oe—0 to 3 inches; black fibrous peat

Ag—3 to 19 inches; dark gray (5Y 4/1), broken face, silty clay, black (5Y 2/1), broken face, moist; weak coarse prismatic structure parting to strong fine angular blocky; extremely hard, firm, very sticky and very plastic; many fine roots in upper part and common roots in the lower part; few fine lime threads pedogenic throughout; strong effervescence throughout (HCl, unspecified); moderately alkaline; clear irregular boundary.

Cg1—19 to 39 inches; light olive gray (5Y 6/2), broken face, silty clay, olive gray (5Y 4/2), broken face, moist; strong fine angular blocky structure; extremely hard, firm, very sticky and very plastic; few pores; strong effervescence throughout (HCl, unspecified); moderately alkaline; gradual wavy boundary.

Cg2—39 to 51 inches; light olive gray (5Y 6/2) silty clay, olive gray (5Y 5/2) moist; massive; extremely hard, firm, very sticky and very plastic; many medium prominent light olive brown (2.5Y 5/6) moist masses of iron accumulation pedogenic throughout; strong effervescence throughout (HCl, unspecified); moderately alkaline; gradual wavy boundary.

2Cg3—51 to 63 inches; gray (5Y 5/1) clay loam, dark gray (5Y 4/1) moist; massive; extremely hard, firm, moderately sticky and moderately plastic; few fine prominent light olive brown (2.5Y 5/4) moist masses of iron accumulation pedogenic throughout; 3 percent mixed gravel; slight effervescence throughout (HCl, unspecified); moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 24 inches
10 to 40 inch particle-size control section: Averages 50 to 60 percent clay
Notes: Some pedons have a Bg horizon.

Grassna Series

Depth class: Very deep
Drainage class: Well or moderately well drained
Permeability: Moderate
Landform: Swales, alluvial fans, and alluvial flats
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Pachic Haplustolls

Typical pedon:
Grassna silt loam, 50 feet south and 45 feet west of the northeast corner of sec. 26, T. 129 N., R. 76 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak medium and fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many roots; many fine pores; neutral; abrupt boundary.

A—7 to 17 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak coarse prismatic structure parting to moderate coarse and medium subangular blocky with some blocks separating to weak platy; hard, friable, slightly sticky and slightly plastic; common roots; many fine pores; neutral; gradual wavy boundary.

Bw1—17 to 30 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate medium and fine subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; common fine pores; few very dark brown (10YR 2/2) moist; clay films on faces of peds; neutral; gradual wavy boundary.

Bw2—30 to 40 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate coarse and medium prismatic structure parting to moderate medium and fine angular blocky; very hard, friable, slightly sticky and slightly plastic; few fine roots; common fine pores; neutral; clear wavy boundary.

Bk—40 to 50 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/4) moist; weak subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine roots; common fine pores; common fine white carbonate masses; violent effervescence; moderately alkaline; gradual wavy boundary.

C—50 to 60 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/4) moist; common medium distinct gray (5Y 5/1) moist; common medium distinct gray (5Y 5/1) moist; and common fine prominent dark yellowish brown (10YR 4/4) moist mottles; massive; hard; friable, slightly sticky and slightly plastic; few fine pores; few small carbonate masses; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches

10 to 40 inch particle-size control section: averages between 18 and 30 percent clay

Notes: The mollic epipedon typically is more than 30 inches thick. Some pedons have BC, BCk, or 2Bk horizons. Coarser or finer textures are below depths of 40 inches in some pedons. Some pedons have visible gypsum in the lower part. Some pedons have Ab horizons below 50 inches.

A horizon:

Value: 3 to 5, 2 or 3 moist
Chroma: 1 or 2
Texture: silt loam, but some is loam or clay loam
Notes: It has 10 to 30 percent very fine sand.

Bw horizon:

Value: 4 or 5, 2 to 4 moist
Chroma: 2 or 3
Texture: silt loam, loam, clay loam, or silty clay loam
Notes: In the lower part, it has hue of 2.5Y in some pedons.

Bk horizon:

Hue: 10YR or 2.5Y
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 5

C horizon:
Value: 6 or 7, 4 to 6 moist
Chroma: 2 to 4

Hamerly Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Flats on till plains
Parent material: Glacial till
Slope: 0 to 3 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls

Typical pedon:
Hamerly loam, 2,090 feet south and 95 feet west of the northeast corner of sec. 26, T. 132 N., R. 56 W. (Colors are for moist soil unless otherwise stated.) (fig. 22)

Ap—0 to 8 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; slightly sticky; strong effervescence; abrupt smooth boundary.

Bk1—8 to 18 inches; light brownish gray (2.5Y 6/2) loam; weak medium and fine subangular blocky structure; friable; violent effervescence; gradual wavy boundary.

Bk2—18 to 25 inches; light brownish gray (2.5Y 6/2) and light olive brown (2.5Y 5/4) loam; weak medium subangular blocky structure; friable; few masses of lime; violent effervescence; gradual wavy boundary.

C—25 to 60 inches; light olive brown (2.5Y 5/4) and olive brown (2.5Y 4/4) loam; common medium distinct gray (2.5Y 5/1) redoximorphic depletions and yellowish brown (10YR 5/6) redoximorphic concentrations; weak medium blocky structure; firm; strong effervescence.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to the calcic horizon: 5 to 16 inches
Salinity: These soils are saline in some map units.
Notes: Some pedons have salt crystals in the upper part of the profile. Some pedons have a BCk horizon.

Ap horizon:
Hue: 10YR or 2.5Y
Value: 2 or 3, 3 to 5 dry
Chroma: 1 or 2

Bk horizon:
Hue: 10YR or 2.5Y
Value: 3 to 6, 5 to 7 dry
Chroma: 1 to 4

C horizon:
Hue: 2.5Y or 5Y
Chroma: 1 to 4



Figure 22. Typical profile of Hamerly loam.

Hanly Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Sandy, mixed, frigid Aridic Ustifluvents

Typical pedon:
Hanly fine sandy loam, 100 feet south and 90 feet east of the northwest corner of sec. 27, T. 135 N., R. 105 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and few coarse roots; slight effervescence; slightly alkaline; clear smooth boundary.

C1—5 to 14 inches; grayish brown (2.5Y 5/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; common fine and few large roots; dark and light colored sand grains have salt and pepper appearance; slight effervescence; slightly alkaline; abrupt smooth boundary.

C2—14 to 16 inches; light brownish gray (2.5Y 6/2) finely stratified fine sandy loam, dark grayish brown (2.5Y 4/2) moist; few brownish yellow (10YR 6/6) stains on faces of plate-like stratifications; massive; slightly hard, very friable, slightly sticky and nonplastic; common fine roots; slight effervescence; slightly alkaline; abrupt smooth boundary.

C3—16 to 60 inches; light brownish gray and grayish brown (2.5Y 6/2 and 5/2) finely stratified loamy fine sand and loamy sand with thin bands of loam and sand, dark grayish brown (2.5Y 4/2) moist; massive; soft, nonsticky and nonplastic; slight effervescence; slightly alkaline.

Range in Characteristics

10 to 40 inch particle-size control section: loamy fine sand or loamy sand averaging less than 10 percent clay It is stratified and contains one or more very thin layers of loam, silt loam, or very fine sandy loam.
Notes: Some pedons have thin Ab horizons below a depth of 40 inches.

A horizon:
Hue: 2.5Y or 10YR
Value: 5 to 7, 4 to 6 moist
Chroma: 2 or 3
Texture: fine sandy loam or sandy loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Notes: Some pedons contain thin coarse sand layers below a depth of 30 inches.

Harriet Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Drainageways and alluvial flats
Parent material: Alluvium
Slope: 0 to 3 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Typic Natraquolls

Typical pedon:
Harriet silt loam, 1,650 feet east and 40 feet north of the southwest corner of sec. 34, T. 139 N., R. 79 W. (Colors are for dry soil unless otherwise stated.)

E—0 to 2 inches; very dark gray (N 3/0) silt loam, gray (N 5/0 and 6/0) dry; weak thick and medium platy structure; friable; many fine roots; common fine pores; few salt crystals visible when soil is dry; moderately alkaline; abrupt wavy boundary.

Btn—2 to 6 inches; black (N 2/0) clay loam, dark gray (N 4/0) dry; moderate medium columnar structure; extremely hard, firm; coatings of very dark gray (N 3/0) on faces of peds; gray (N 5/0 dry) on tops and sides of columns; slight effervescence on inside of columns; strongly alkaline; clear wavy boundary.

Btnz—6 to 18 inches; very dark grayish brown (2.5Y 3/2) clay loam, grayish brown (2.5Y 5/2) dry; moderate coarse prismatic and weak medium subangular blocky structure; very hard, firm; few roots; common medium pores; common fine white salt crystals; strong effervescence; strongly alkaline; gradual wavy boundary.

Bz1—18 to 28 inches; dark grayish brown (2.5Y 4/2) loam, grayish brown and light brownish gray (2.5Y 5/2 and 6/2) dry; weak coarse prismatic structure; very hard, firm; few fine roots; few medium and fine pores; fine salt crystals visible when dry; violent effervescence; strongly alkaline; abrupt smooth boundary.

2Bz2—28 to 38 inches; light olive brown (2.5Y 5/3) very fine sandy loam, light yellowish brown (2.5Y 6/3) dry; weak coarse prismatic and weak coarse and medium subangular blocky structure; very hard, friable; few fine pores; common very fine salt crystals that are visible when dry; strong effervescence; strongly alkaline; abrupt smooth boundary.

3Ab—38 to 40 inches; very dark gray (N 3/0) clay loam, dark gray (N 4/0) dry; few medium distinct olive brown (2.5Y 4/3) redoximorphic concentrations; weak coarse prismatic structure; very hard, firm; few fine roots; strong effervescence; strongly alkaline; abrupt smooth boundary.

3C—40 to 60 inches; olive brown (2.5Y 4/3) stratified loam and clay loam, light yellowish brown (2.5Y 6/3) dry; weak coarse and medium subangular blocky structure; very hard, friable; strong effervescence; strongly alkaline.

Range in Characteristics

Notes: Some pedons have an A, Bk, BCk, or C horizon.

Btn horizon:
Hue: 10YR, 2.5Y, or neutral
Value: 2 to 4 moist
Chroma: 0 to 2

Bz and 2Bz horizons:
Hue: 2.5Y or 5Y
Value: 3 to 5 moist

3C horizon:
Hue: 2.5Y or 5Y
Value: 3 to 5 moist
Notes: Some pedons do not have a 3C horizon.

Havre Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 6 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustifluvents

Typical pedon:
Havre silt loam, 2,200 feet south and 810 feet west of northeast corner of sec. 27, T. 143 N., R. 105 E. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, sticky and plastic; common very fine and fine roots; few very fine pores; strong effervescence; slightly alkaline; clear smooth boundary.

C1—6 to 10 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure parting to weak very thin platy; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine pores; thin dark layers throughout; strong effervescence; slightly alkaline; abrupt smooth boundary.

C2—10 to 25 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure parting to moderate thin platy; slightly hard, very friable, sticky and plastic; common fine roots; common very fine pores; thin dark layers throughout; violent effervescence; slightly alkaline; abrupt smooth boundary.

C3—25 to 32 inches; light brownish gray (2.5Y 6/2) loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine pores; violent effervescence; moderately alkaline; clear wavy boundary.

C4—32 to 54 inches; light brownish gray (2.5Y 6/2) stratified silt loam and silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive with strata separating to weak thin plates; slightly hard, very friable, sticky and plastic; few very fine roots; few very fine pores; strong effervescence; moderately alkaline; clear wavy boundary.

C5—54 to 60 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; thin dark layers throughout; violent effervescence; slightly alkaline.

Range in Characteristics

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 4 or 5 moist
Chroma: 2 or 3
Texture: loam or silt loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 or 6
Chroma: 2 or 3
Texture: loam or silt loam with thin strata of silty clay loam
Notes: It has 15 to 60 percent rock fragments below a depth of 40 inches in some pedons.

Havrelon Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, calcareous, frigid Typic Ustifluvents

Typical pedon:
Havrelon silt loam, 2,565 feet south and 75 feet east of the northwest corner of sec. 2, T. 139 N., R. 81 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 13 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate medium granular structure; very friable; common roots; common fine pores; slight effervescence; slightly alkaline; abrupt smooth boundary.

C1—13 to 18 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium granular structure; contains a thin stratification; friable; common fine and few large roots; common fine pores; slight effervescence; slightly alkaline; abrupt smooth boundary.

C2—18 to 26 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate medium granular structure; very friable; few roots; slight effervescence; slightly alkaline; clear smooth boundary.

C3—26 to 40 inches; thinly stratified light gray (2.5Y 7/2) and light brownish gray (2.5Y 6/2) very fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; very friable; thin strata of fine sandy loam and silty clay loam; slight effervescence; slightly alkaline; clear smooth boundary.

C4—40 to 46 inches; thinly stratified olive gray (5Y 5/2) silt loam and silty clay loam, olive gray (5Y 4/2) moist; common medium distinct reddish yellow (5YR 7/8) redoximorphic concentrations; massive; friable; slight effervescence; slightly alkaline; clear smooth boundary.

C5—46 to 60 inches; pale yellow (5Y 7/3) very fine sandy loam, olive (5Y 4/3) moist; massive; very friable; slight effervescence; slightly alkaline.

Range in Characteristics

Salinity: The soil is saline in some map units.
Notes: Some pedons have an Ab horizon.

Ap horizon:
Hue: 10YR or 2.5Y
Value: 3 or 4 moist

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 3 to 5 moist

Haydraw Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Alluvial fans and paleoterrraces
Parent material: Alluvium
Slope: 0 to 6 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-silty, mixed, superactive, frigid Aridic Calciustolls

Typical pedon:
Haydraw silt loam, 1,675 feet west and 610 feet south of the northeast corner of sec. 2, T. 146 N., R. 102 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to moderate medium granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; slight effervescence; slightly alkaline; clear smooth boundary.

Bk1—6 to 18 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, firm, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; strong effervescence; few fine masses of carbonates; moderately alkaline; clear wavy boundary.

Bk2—18 to 28 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, firm, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; violent effervescence; few fine masses of carbonates; moderately alkaline; clear wavy boundary.

Bk3—28 to 41 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; violent effervescence; few fine masses of carbonates; moderately alkaline; gradual wavy boundary.

BCk—41 to 58 inches; light yellowish brown (2.5Y 6/4) silt loam, olive brown (2.5Y 4/4) moist; weak coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores;

strong effervescence; few fine masses of carbonates; moderately alkaline; gradual wavy boundary.

C—58 to 80 inches; light yellowish brown (2.5Y 6/4) silt loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; strong effervescence; moderately alkaline.

Range in Characteristics:

Depth to the calcic horizon: Less than 16 inches
Notes: Some pedons have an ABk horizon or a calcareous Bw horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5
Chroma: 2 or 3

Bk horizon:
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam
Notes: The calcium carbonate equivalent is 15 to 40 percent.

C horizon:
Hue: 10YR or 2.5Y
Value: 6 or 7, 4 or 5 moist
Chroma: 2 to 4
Texture: silt loam, silty clay loam, or very fine sandy loam
Notes: It has a texture of silty clay below a depth of 60 inches in some pedons. The calcium carbonate equivalent is 1 to 15 percent.

Heil Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Depressions
Parent material: Alluvium
Slope: 0 to 1 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Typic Natraquerts

Typical pedon:
Heil silt loam, 650 feet west and 20 feet south of the northeast corner of sec. 14, T. 135 N., R. 100 W. (Colors are for dry soil unless otherwise stated.)

E—0 to 3 inches; dark gray (10YR 4/1) silt loam, light gray (10YR 6/1) dry; common fine distinct brown (10YR 5/3) and dark brown (10YR 4/3) redoximorphic concentrations; moderate fine subangular blocky and weak thin platy structure; firm; many roots; many fine pores; neutral; abrupt wavy boundary.

Btn—3 to 7 inches; very dark gray (2.5Y 3/1) silty clay, gray (2.5Y 5/1) dry; strong coarse and medium columnar structure parting to strong coarse medium and fine angular blocky; extremely hard, very firm; roots in cracks; few pores; slightly alkaline; gradual smooth boundary.

Btng—7 to 24 inches; very dark gray (5Y 3/1) silty clay, gray (5Y 5/1) dry; strong very coarse prismatic structure parting to strong coarse and medium angular blocky;

extremely hard, very firm; few roots; surface of peds has a glossy appearance when moist; few tongues of E (5Y 6/1) dry; moderately alkaline; gradual wavy boundary.

Bg—24 to 38 inches; dark gray (5Y 4/1) silty clay, light gray (5Y 6/1) dry; moderate coarse angular blocky structure; extremely hard, very firm; strong effervescence; moderately alkaline; gradual wavy boundary.

Byg1—38 to 44 inches; dark gray (5Y 4/1) silty clay, light gray (5Y 6/1) dry; weak coarse and fine angular blocky structure; very firm; few fine gypsum crystals; strong effervescence; moderately alkaline; diffuse wavy boundary.

Byg2—44 to 52 inches; olive (5Y 4/3) silty clay, pale olive (5Y 6/3) dry; weak coarse subangular blocky structure; very firm; common gypsum crystals; strong effervescence; strongly alkaline; gradual wavy boundary.

Cg—52 to 60 inches; olive (5Y 5/4) silty clay, pale olive (5Y 6/3) dry; many strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) redoximorphic concentrations and gray (5Y 5/1) redoximorphic depletions; massive; few large white masses of lime; strong effervescence; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 45 inches
Depth to lime: 12 to 40 inches
Depth to the Btn horizon: 1 to 4 inches
Notes: Some pedons have an A horizon up to 3 inches thick. Some pedons have a Btkn or Bk horizon.

E horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 2 to 5, 4 to 8 dry
Chroma: 1 or 2

Btn horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 2 to 4, 4 to 6 dry
Chroma: 1 or 2
Texture: silty clay or clay

Bg and Byg horizons:
Hue: 2.5Y or 5Y
Value: 3 to 5, 4 to 7 dry
Texture: silty clay, clay, silty clay loam, or clay loam

Cg horizon:
Hue: 2.5Y or 5Y
Value: 3 to 5, 5 to 7 dry
Chroma: 1 to 4
Texture: silty clay, clay, silty clay loam, or clay loam

Hoffmanville Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Flood plains and low terraces
Parent material: Alluvium

Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Clayey over sandy or sandy-skeletal, smectitic over mixed, calcareous, frigid Typic Ustifluvents

Typical pedon:
Hoffmanville silty clay, 180 north and 200 feet east of the southwest corner of sec. 24, T. 26 N., R. 59 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 8 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium angular blocky structure parting to moderate coarse granular; very hard, firm, very sticky and very plastic; common very fine roots; slight effervescence; slightly alkaline; abrupt smooth boundary.

C1—8 to 20 inches; light brownish gray (2.5Y 6/2) stratified silty clay loam and silty clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, very sticky and very plastic; stratifications 1 to 2 mm thick; common very fine roots throughout; common fine irregular masses of lime; slight effervescence; moderately alkaline; abrupt smooth boundary.

C2—20 to 26 inches; light brownish gray (2.5Y 6/2) stratified silty clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, very sticky and very plastic; stratifications 1 to 2 mm thick; few very fine roots; common fine irregular masses of lime and common fine carbonate threads; strong effervescence; moderately alkaline; abrupt smooth boundary.

2C3—26 to 41 inches; light brownish gray (2.5Y 6/2) stratified loamy fine sand, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, slightly sticky and nonplastic; stratifications 1 to 2 mm thick; few very fine roots; few fine irregular masses of lime; slight effervescence; moderately alkaline; clear smooth boundary.

2C4—41 to 50 inches; light brownish gray (2.5Y 6/2) stratified fine sandy loam; dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; stratifications 1 to 2 mm thick; few very fine roots; common fine irregular dark yellowish brown (10YR 4/6) iron concretions pedogenic; slight effervescence; moderately alkaline; abrupt smooth boundary.

3C5—50 to 61 inches; grayish brown (2.5Y 5/2) stratified silty clay and silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, very sticky and very plastic; stratifications 1 to 2 mm thick; common fine irregular masses of lime; common fine irregular dark yellowish brown (10YR 4/6) iron concretions; strong effervescence; moderately alkaline; abrupt smooth boundary.

4C6—61 to 80 inches; light brownish gray (2.5Y 6/2) stratified fine sandy loam and silt loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; stratifications 1 to 2 mm thick; common fine irregular dark yellowish brown (10YR 4/6) iron concretions; slight effervescence; moderately alkaline.

Range in Characteristics

Depth to the 2C horizon: 20 to 40 inches

Ap horizon:
Hue: 2.5Y, 5Y, or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 1 to 3

C horizon:
Hue: 2.5Y, 5Y, or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 1 to 3
Texture: silty clay or silty clay loam
Notes: It has thin strata of loam and silt loam in some pedons.

2C horizon:
Hue: 2.5Y, 5Y, or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 1 to 3
Texture: loamy fine sand or fine sand
Notes: It has up to 35 percent gravel.

Janesburg Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Landform: Pediments, divides, knolls, hills, escarpments, and ridges
Parent material: Residuum
Slope: 0 to 25 percent
Notes: These soils are sodic.

Taxonomic class: Fine, smectitic, frigid Typic Natrustolls

Typical pedon:
Janesburg silt loam, 2,050 feet south and 50 feet east of the northwest corner of sec. 36, T. 137 N., R. 87 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; many fine and very fine roots; common fine pores; slightly acid; clear wavy boundary.

E—8 to 10 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure parting to weak medium platy; slightly hard, friable, sticky and plastic; many fine and very fine roots; many fine pores; slightly acid; abrupt wavy boundary.

Btn1—10 to 16 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; strong medium columnar structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; common fine and very fine roots between peds; common fine pores; many faint dark grayish brown (10YR 4/2) dry clay films on faces of peds; column tops coated with light brownish gray (10YR 6/2) dry E material; slightly alkaline; clear wavy boundary.

Btn2—16 to 21 inches; light brownish gray (10YR 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm, very sticky and very plastic; few fine roots; common fine pores; few faint grayish brown (2.5Y 5/2) dry clay films on faces of peds; slightly alkaline; abrupt wavy boundary.

BCk—21 to 26 inches; light yellowish brown (2.5Y 6/4) silt loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to weak medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few fine roots; few fine pores; few medium irregular masses of lime; strong effervescence; moderately alkaline; clear wavy boundary.

Cr—26 to 60 inches; light yellowish brown (2.5Y 6/4) and olive yellow (2.5Y 6/6) soft siltstone bedrock, olive brown (2.5Y 4/4) and light olive brown (2.5Y 5/6) moist; common irregular masses of lime between siltstone stratifications; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to gypsum or other salts: More than 16 inches
Depth to soft bedrock: 20 to 40 inches

A horizon:
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Texture: silt loam, loam, or fine sandy loam

E horizon:
Value: 5 or 6, 3 or 4 moist
Chroma: 1 to 3
Texture: silt loam, loam, or fine sandy loam

Btn horizon:
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: silty clay, clay, silty clay loam, or clay loam

BCk horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam, silt loam, clay loam, silty clay loam, or silty clay

Cr horizon:
Notes: It is soft shale, siltstone, or mudstone.

Kirby Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform: Hills and ridges
Parent material: Residuum
Slope: 6 to 70 percent
Notes: These soils are calcareous.

Taxonomic class: Loamy-skeletal over fragmental, mixed, superactive, calcareous, frigid Aridic Ustorthents

Typical pedon:
Kirby very channery loam, 700 feet north and 700 feet east of the southwest corner of sec. 35, T. 7 S., R. 42 E. (Colors are for dry soil unless otherwise stated.)

A—0 to 4 inches; reddish brown (5YR 5/4) very channery loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; 40 percent porcelanite channers; slight effervescence; moderately alkaline; clear wavy boundary.

Bk—4 to 12 inches; reddish brown (5YR 5/4) extremely channery loam, reddish brown (5YR 4/4) moist; weak fine granular structure; slightly hard, friable, slightly

sticky and slightly plastic; common fine and very fine roots between and matted on top of channers; 70 percent porcelanite channers, 5 percent flagstones; common distinct lime coats on rock fragments; strong effervescence; moderately alkaline; gradual wavy boundary.

2C—12 to 60 inches; light red (2.5YR 6/6) hard, shattered and fractured porcelanite, red (2.5YR 5/6) moist; few fine roots in cracks; common faint lime coats on lower surfaces of fragments in the upper few inches of the horizon.

Range in Characteristics

Depth to fragmental material: 11 to 20 inches
10 to 40 inch particle-size control section: 40 to 90 percent porcelanite rock fragments

A horizon:
Hue: 5YR or 7.5YR
Value: 5 or 6, 4 or 5 moist
Chroma: 3 to 6
Notes: Rock fragments range from 15 to 60 percent. The fragments are 0 to 10 percent flagstones and stones and 15 to 70 percent channers.

Bk horizon:
Hue: 2.5YR, 5YR, or 7.5YR
Value: 5 to 7, 4 to 6 moist
Chroma: 3 to 6
Texture: loam or sandy loam
Notes: Rock fragments range from 40 to 90 percent. The fragments are 5 to 20 percent flagstones and cobbles and 35 to 70 percent channers.

2C horizon:
Notes: It consists of highly fractured and displaced porcelanite. The fragments are flagstones, stones, and channers. Rock fragments range from 90 to 95 percent.

Korchea Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, calcareous, frigid Mollic Ustifluvents

Typical pedon:
Korchea stratified loam, 790 feet south and 110 feet west of the northeast corner of sec. 36, T. 129 N., R. 102 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; grayish brown (10YR 5/2) stratified loam, very dark grayish brown (10YR 3/2) moist; weak coarse and medium subangular blocky structure parting to moderate fine granular; hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine pores; slight effervescence; moderately alkaline; clear smooth boundary.

C1—6 to 15 inches; grayish brown (10YR 5/2) stratified loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; many fine pores; slight effervescence; moderately alkaline; abrupt smooth boundary.

C2—15 to 18 inches; grayish brown (2.5Y 5/2) stratified fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, slightly sticky, and slightly plastic; common fine roots; many fine pores; slight effervescence; moderately alkaline; abrupt smooth boundary.

C3—18 to 36 inches; grayish brown (2.5Y 5/2) stratified loam, silt loam and very fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky, and slightly plastic; common fine roots in upper part, few fine roots in lower part; very few fine masses of carbonates; strong effervescence; moderately alkaline; gradual smooth boundary.

C4—36 to 60 inches; grayish brown (2.5Y 5/2) stratified fine sandy loam and loam, grayish brown (2.5Y 4/2) moist; massive; slightly hard and hard, friable, slightly sticky and slightly plastic; few fine roots; slight effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 0 to 5 inches

A horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 3 to 5

C horizon:
Value: 5 or 6, 3 to 5 moist
Chroma: 2 to 4
Texture: sandy loam to silty clay loam
Notes: It is stratified. It has sand or fine sand below a depth of 40 inches in some pedons.

Korell Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Fluventic Haplustolls

Typical pedon:
Korell silt loam, 2,200 feet east and 50 feet south of the northwest corner of sec. 36, T. 138 N., R. 86 W. (Colors are for dry soil unless otherwise stated.) (fig. 23.)

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; slightly alkaline; abrupt smooth boundary.



Figure 23. Typical profile of Korell silt loam.

Bw—8 to 15 inches; light olive brown (2.5Y 5/3) loam, olive brown (2.5Y 4/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine pores; strong effervescence; moderately alkaline; clear wavy boundary.

Bk—15 to 27 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; common fine irregularly shaped masses of lime; violent effervescence; moderately alkaline; abrupt smooth boundary.

Ab—27 to 32 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; many fine irregularly shaped masses of lime; violent effervescence; moderately alkaline; clear smooth boundary.

Bk'—32 to 48 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine pores; many fine irregularly shaped masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

C—48 to 60 inches; light yellowish brown (2.5Y 6/3) stratified silt loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine pores; common fine irregularly shaped masses of lime; violent effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 15 inches
Notes: The organic carbon decreases irregularly with depth. An Ab horizon up to 6 inches thick is allowed.

A horizon:
Value: 4 or 5, 2 or 3 moist
Chroma: 1 or 2
Texture: loam or silt loam

Bw horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 2 or 3
Texture: loam or silt loam

BCk, Bk, or C horizons:
Hue: 10YR or 2.5Y
Value: 5 or 6, 4 or 5 moist
Chroma: 2 or 3
Texture: loam or silt loam
Notes: The C horizon is stratified.

Krem Series

Depth class: Very deep
Drainage class: Well drained

Permeability: Rapid over moderate
Landform: Plains and terraces
Parent material: Eolian over glacial till
Slope: 3 to 6 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Paleustolls

Typical pedon:
Krem loamy fine sand, 1,850 feet east and 135 feet south of the northwest corner of sec. 17, T. 144 N., R. 85 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; very friable, nonsticky and nonplastic; common very fine, medium, and coarse roots; very few pebbles; neutral; clear smooth boundary.

A1—7 to 15 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; very friable; nonsticky and nonplastic; common very fine and few fine roots; very few pebbles; neutral; clear wavy boundary.

A2—15 to 25 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; very friable, nonsticky and nonplastic; common very fine and few medium roots; many very fine tubular pores; very few pebbles; krotovina 3 inches in diameter; neutral; abrupt wavy boundary.

BA—25 to 30 inches; brown (10YR 5/3) loamy sand, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; loose, nonsticky and nonplastic; few very fine roots; common very fine and medium tubular pores; about 5 percent rock fragments; slightly alkaline; abrupt irregular boundary.

2Bt—30 to 38 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; common fine distinct strong brown (7.5YR 5/6) dry redoximorphic concentrations; strong coarse prismatic structure parting to strong angular blocky; sticky and plastic; few very fine and fine roots; many very fine tubular pores; many moderately thick clay films on faces of peds and surface of pores; sandy coatings up to 1/4 inch thick between prisms; about 3 percent rock fragments; some are coated with lime; slightly alkaline; clear irregular boundary.

2Btk—38 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; common fine distinct strong brown (7.5YR 5/6) dry redoximorphic concentrations; strong very coarse prismatic structure parting to moderate medium and coarse angular blocky; sticky and plastic; few very fine and fine roots along faces of prisms; many very fine tubular pores; many moderately thick dark grayish brown (2.5Y 4/2) clay films on faces of peds and surfaces of pores; sandy coatings up to 1/4 inch thick between prisms; about 3 percent rock fragments and one larger weathered sandstone fragment; many irregular shaped masses of lime; violent effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: More than 20 inches
Depth to glacial till: 20 to 40 inches
Notes: Some pedons have 2Bk, 2BC, or 2C horizons.

A horizon:
Value: 3 to 5
Chroma: 2 or 3
Texture: loamy fine sand, fine sand, or loamy sand

BA horizon:
Value: 5 or 6, 3 or 4 moist
Chroma: 2 or 3
Texture: loamy sand or loamy fine sand

2Bt horizon:
Hue: 2.5Y or 10YR
Value: 4 to 6, 3 or 4 moist
Chroma: 2 or 3
Texture: clay loam, sandy clay loam, or loam
Notes: It has up to 10 percent rock fragments.

Kremlin Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Alluvial flats, alluvial fans, hills, stream terraces, ridges, escarpments, and paleoterraces
Parent material: Alluvium
Slope: 0 to 25 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Kremlin loam, 1,000 feet south and 1,700 feet east of the northwest corner of sec. 23, T. 30 N., R. 10 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, sticky and plastic; many fine and very fine roots; neutral; abrupt smooth boundary.

A—6 to 11 inches; dark grayish brown (2.5Y 4/2) loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable, sticky and plastic; many very fine roots; many very fine pores; neutral; clear smooth boundary.

Bw—11 to 19 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine roots; many very fine pores; neutral; clear smooth boundary.

Bk1—19 to 31 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/4) moist; weak fine subangular blocky structure; hard, friable, sticky and plastic; many very fine roots; many very fine pores; few fine masses of lime; strong effervescence; moderately alkaline; clear smooth boundary.

Bk2—31 to 60 inches; light yellowish brown (2.5Y 6/4) loam, grayish brown (2.5Y 5/2) moist; weak fine subangular blocky structure; hard, friable, sticky and plastic; common very fine roots; common very fine pores; common fine masses of lime; violent effervescence; moderately alkaline; gradual boundary.

Range in Characteristics

Mollic epipedon thickness: 7 to 15 inches
Depth to the Bk horizon: 10 to 24 inches

A horizons:
Value: 4 or 5, 3 or 4 moist

Chroma: 2 or 3
Texture: loam or silt loam

Bw horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: loam, silt loam, or clay loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 8, 4 to 6 moist
Chroma: 2 to 4
Texture: loam, silt loam, or clay loam

Lakota Series

Depth class: Deep and very deep
Drainage class: Well drained
Permeability: Slow
Landform: Terraces on uplands
Parent material: Alluvium and residuum
Slope: 6 to 15 percent
Notes: These soils are saline-sodic.

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Leptic Natrustolls

Typical pedon:
Lakota fine sandy loam, 2,500 feet north and 1,000 feet east of the southwest corner of sec. 7, T. 133 N., R. 81 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine roots; slightly acid; clear smooth boundary.

E—4 to 8 inches; brown (10YR 5/3) loamy fine sand, dark brown (10YR 3/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; neutral; abrupt wavy boundary.

Btn—8 to 14 inches; grayish brown (2.5Y 5/2) fine sandy loam, very dark grayish brown (2.5Y 3/2) moist; strong medium columnar structure parting to strong medium and fine angular blocky; extremely hard, extremely firm, slightly sticky and slightly plastic; common very fine and few fine roots along faces of peds; column tops coated with light brownish gray (10YR 6/2) E material; common distinct clay bridges between mineral grains; slightly alkaline; clear wavy boundary.

Bkz—14 to 25 inches; light olive brown (2.5Y 5/3) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common fine nests and threads of salts; few medium irregularly shaped masses of carbonates; strong effervescence; moderately alkaline; clear wavy boundary.

BCz—25 to 34 inches; light olive gray (5Y 6/2) loamy fine sand, olive gray (5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine threads of salts; slight effervescence; slightly alkaline; gradual wavy boundary.

C—34 to 50 inches; light olive gray (5Y 6/2) loamy fine sand, olive gray (5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; moderately alkaline; clear wavy boundary.

Cr—50 to 60 inches; light olive gray (5Y 6/2) and pale olive (5Y 6/3) soft sandstone bedrock; olive gray (5Y 5/2) and olive (5Y 5/3) moist; massive; slightly alkaline.

Range in Characteristics

Depth to gypsum or other salts: 10 to 16 inches
Depth to soft bedrock: More than 40 inches
Notes: Some pedons have By, Bkyz, Bky, and Byz horizons. Combined thickness of these horizons ranges from 0 to 16 inches. Some pedons have a Bk or a BCy horizon.

A horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3
Texture: fine sandy loam or sandy loam

E horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 1 to 3
Texture: loamy fine sand, fine sand, sandy loam, fine sandy loam, or loamy sand

Btn horizon:
Hue: 10YR or 2.5Y
Value: 3 to 6, 2 to 4 moist
Chroma: 2 or 3
Texture: fine sandy loam, loam, or sandy loam

Bkz horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 4
Texture: fine sandy loam, sandy loam, loamy fine sand, or loamy sand

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 6 or 7, 3 to 5 moist
Chroma: 2 to 4
Texture: loamy fine sand, loamy sand, fine sandy loam, or fine sand

Lallie Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Drainageways
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Fine, smectitic, calcareous, frigid Vertic Fluvaquents

Typical pedon:
Lallie silty clay loam, 2,630 feet east and 1,300 feet south of the northwest corner of sec. 21, T. 151 N., R. 61 W. (Colors are for moist soil unless otherwise stated.)

A—0 to 2 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium and fine granular structure; slightly hard, friable, sticky and plastic; many roots; common fine flecks of salt; strong effervescence; slightly alkaline; abrupt smooth boundary.

Cg —2 to 24 inches; dark gray (5Y 4/1) silty clay loam, light gray and gray (5Y 6/1) dry; common medium prominent dark yellowish brown (10YR 4/4) redoximorphic concentrations; weak coarse prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, sticky and plastic; common fine roots; few fine flecks of salt; violent effervescence; slightly alkaline; abrupt wavy boundary.

Ab—24 to 32 inches; black (N 2/0) silty clay, very dark gray (5Y 3/1) dry; weak coarse prismatic structure parting to moderate medium and fine subangular blocky; hard, firm, very sticky and very plastic; few fine roots; common fine flecks of salt; few snail shell fragments; strong effervescence; moderately alkaline; gradual wavy boundary.

Cg'—32 to 60 inches; olive gray (5Y 4/2) silty clay, light gray and gray (5Y 6/1) dry; common fine prominent yellowish brown (10YR 5/4) redoximorphic concentrations; massive; very hard, very firm, very sticky and very plastic; few flecks of salt; common snail fragments; strong effervescence; slightly alkaline.

Range in Characteristics

10 to 40 inch particle-size control section average: 35 to 60 percent clay
Notes: Some pedons have an O horizon.

A horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 2 to 4, 3 to 6 dry
Chroma: 1 or 2

Cg horizon:
Hue: 2.5Y, 5Y, or neutral
Value: 3 to 6, 4 to 8 dry
Chroma: 0 to 2
Texture: silty clay loam, silty clay, or clay

Lambert Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Alluvial fans
Parent material: Alluvium
Slope: 0 to 15 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-silty, mixed, superactive, calcareous, frigid Typic Ustorthents

Typical pedon:
Lambert silt loam, 550 feet west and 600 feet north of the south 1/4 corner of sec. 7, T. 1 S., R. 27 E. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly

plastic; many very fine roots; many very fine interstitial pores; slight effervescence; moderately alkaline; gradual boundary.

C1—5 to 22 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure grading with increased depth to massive; many grading to few very fine roots; common very fine and fine tubular pores; strong effervescence; moderately alkaline; gradual boundary.

C2—22 to 36 inches; light olive gray (5Y 6/2) silt loam, olive gray (5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine tubular pores; strong effervescence; moderately alkaline; gradual boundary.

C3—36 to 60 inches; light olive gray (5Y 6/2) very fine sandy loam, olive gray (5Y 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; strong effervescence.

Range in Characteristics

A horizon:
Hue: 5Y, 2.5Y, or 10YR
Value: 5 or 6
Chroma: 2 or 3

C horizon:
Hue: 5Y, 2.5Y, or 10YR
Value: 6 or 7
Chroma: 2 or 3

Lawther Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Alluvial flats
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Fine, smectitic, frigid Udic Haplusterts

Typical pedon:
Lawther silty clay, 2,195 feet south and 1,440 feet east of the northwest corner of sec. 25, T. 131 N., R. 98 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 4 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; weak medium and coarse subangular blocky structure parting to moderate medium granular; very hard, firm, sticky and very plastic; common very fine pores; slightly alkaline; abrupt smooth boundary.

A—4 to 10 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; moderate coarse subangular blocky structure; very hard, very firm, sticky and very plastic; common very fine roots; common very fine pores; slightly alkaline; clear wavy boundary.

Bss1—10 to 21 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to moderate fine and

medium subangular blocky; very hard, firm, very sticky and very plastic; common very fine roots; common very fine pores; very dark grayish brown (2.5Y 3/2) coatings on faces of peds; 1 inch wide cracks filled with A horizon material; common slickensides; very slight effervescence; slightly alkaline; gradual wavy boundary.

Bss2—21 to 33 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse and medium subangular blocky structure parting to moderate fine subangular blocky; very hard, firm, very sticky and very plastic; few very fine roots; common very fine pores; 1/2 inch wide cracks filled with A horizon material; common slickensides; few medium irregularly shaped masses of lime; strong effervescence; moderately alkaline; clear wavy boundary.

Bk—33 to 47 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine roots; common very fine pores; 1/2 inch wide cracks filled with A horizon material; common slickensides; common fine irregularly shaped masses of lime; strong effervescence; moderately alkaline; abrupt wavy boundary.

C—47 to 60 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; very hard, firm, very sticky and very plastic; few very fine roots; many very fine pores; common fine irregularly shaped masses of lime; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 45 inches
Depth to lime: 0 to 30 inches
Notes: When the soil is dry, cracks 1/2 to 2 inches wide and several feet long extend downward through the Bss horizon. Some pedons have a By horizon up to 15 inches thick.

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, 2 or 3 moist

Bss horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 3 to 6, 2 to 4 moist
Chroma: 1 to 3
Texture: clay, silty clay, or silty clay loam

Bk horizon:
Hue: 2.5Y or 5Y
Value: 4 to 6, 2 to 5 moist
Chroma: 1 or 2
Texture: silty clay, clay, or silty clay loam
Notes: Some pedons do not have a Bk horizon.

C horizon:
Hue: 2.5Y or 5Y
Value: 4 to 7, 3 to 6 moist
Chroma: 1 to 3
Texture: clay loam, silty clay, clay, or silty clay loam

Lefor Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Landform: Pediments
Parent material: Residuum
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy, mixed, semiactive, frigid Typic Argiustolls

Typical pedon:
Lefor fine sandy loam, 2,555 feet south and 290 feet east of the northwest corner of sec. 13, T. 137 N., R. 94 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to moderate medium and fine granular; hard, friable, slightly sticky; many roots; many fine pores; medium acid; abrupt smooth boundary.

B/E—7 to 15 inches; brown (10YR 5/3) (B) and dark grayish brown (10YR 4/2) (E) fine sandy loam, dark brown (10YR 3/3) moist; strong coarse prismatic structure parting to weak coarse to fine subangular blocky; hard, friable, slightly sticky; many roots; many fine pores; slightly acid; clear wavy boundary.

Bt1—15 to 24 inches; light yellowish brown (2.5Y 6/3) sandy clay loam, olive brown (2.5Y 4/4) moist; brown (10YR 5/3) coatings on faces of prisms; strong very coarse prismatic structure parting to moderate medium angular blocky; very hard, friable, slightly sticky and slightly plastic; common roots; many fine pores; neutral; gradual wavy boundary.

Bt2—24 to 30 inches; light yellowish brown (2.5Y 6/4) sandy clay loam, olive brown (2.5Y 4/4) moist; thin grayish brown (2.5Y 5/2) coatings on faces of prisms; strong very coarse prismatic structure parting to moderate medium angular blocky; very hard, friable, slightly sticky and slightly plastic; few fine roots; common fine pores; slightly alkaline; clear wavy boundary.

Bk—30 to 36 inches; pale yellow (2.5Y 7/4) fine sandy loam, light olive brown (2.5Y 5/4) moist; strong very coarse prismatic structure parting to moderate medium angular blocky; hard, friable, slightly sticky and slightly plastic; few roots; common fine and medium pores; few fine masses of carbonates; strong effervescence; moderately alkaline; clear wavy boundary.

Cr—36 to 60 inches; pale yellow and white (2.5Y 7/4 and 8/4 and 5Y 8/2) soft sandstone, light yellowish brown and light gray (2.5Y 6/4 and 5Y 7/2) moist; gypsum crystals in some layers; slight effervescence in some layers and no effervescence in others; moderately alkaline.

Range in Characteristics

Depth to soft bedrock: 20 to 40 inches.
Notes: Some pedons have a Bw horizon below the Bt horizon. Some pedons have a BC or C horizon above the Cr horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Texture: loam, sandy loam, or fine sandy loam

B/E horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 2 to 5 moist
Chroma: 2 to 4
Texture: fine sandy loam, loam, or sandy loam

Bt horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 6
Texture: sandy clay loam or loam
Notes: It averages between 15 and 30 percent silt and 25 and 65 percent fine sand and coarser sand. The peds have faint to distinct clay films and have stains of organic matter.

Bk horizon:
Hue: 2.5Y or 10YR
Value: 5 to 8, 4 to 6 moist
Chroma: 2 to 8
Texture: fine sandy loam, sandy loam, loam, or sandy clay loam

Lehr Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid over very rapid
Landform: Stream terraces
Parent material: Alluvium
Slope: 0 to 25 percent

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Lehr loam, 1,490 feet north and 625 feet west of the southeast corner of sec. 12, T. 156 N., R. 93 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; about 2 percent gravel; slightly alkaline; abrupt smooth boundary.

Bw—6 to 11 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; about 5 percent gravel; slightly alkaline; gradual wavy boundary.

Bk1—11 to 15 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; few distinct very dark grayish brown (10YR 3/2) coatings on faces of peds; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; about 10 percent gravel; common medium irregular masses and filaments of lime; thin crusts of lime on undersides of pebbles; violent effervescence; moderately alkaline; clear smooth boundary.

2Bk2—15 to 22 inches; light yellowish brown (10YR 6/4) and white (10YR 8/1) gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; weak medium

prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; about 30 percent gravel; many medium irregular masses and filaments of lime; thin crusts of lime on undersides of pebbles; violent effervescence; moderately alkaline; clear smooth boundary.

2C—22 to 60 inches; light brownish gray (2.5Y 6/2) and pale yellow (2.5Y 7/4) very gravelly coarse sand, grayish brown (2.5Y 5/2) and light yellowish brown (2.5Y 6/4) moist; single grain; loose, nonsticky and nonplastic; about 40 percent gravel; thin crusts of lime on undersides of pebbles; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to sand and gravel: 14 to 20 inches
Notes: Some pedons have a 2BCk horizon.

Ap horizon:
Value: 3 or 4, 2 or 3 moist

Bw horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4

Bk horizon:
Notes: Rock fragments range from 2 to 30 percent.

2Bk horizon:
Notes: Rock fragments range from 20 to 55 percent.

2C horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 4 or 5 moist
Notes: Rock fragments range from 15 to 60 percent.

Lihen Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Alluvial fans, stream terraces, and alluvial flats
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Sandy, mixed, frigid Entic Haplustolls

Typical pedon:
Lihen loamy fine sand, 2,680 feet south and 2,600 feet west of the northeast corner of sec. 14, T. 29 N., R. 53 E. (Colors are for dry soil unless otherwise stated.)

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark brown (10YR 2/2) moist; weak fine platy structure; soft, very friable, nonsticky and nonplastic; many fine roots; many fine and medium tubular pores; 2 percent pebbles; slightly alkaline; clear smooth boundary.

A2—4 to 9 inches; grayish brown (10YR 5/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many fine roots; common fine pores and few medium pores; 10 percent pebbles; slightly alkaline; clear smooth boundary.

A3—9 to 24 inches; grayish brown (10YR 5/2) loamy sand, very dark grayish brown (10YR 3/2) moist; single grain; loose, very friable, nonsticky and nonplastic; common fine roots; few pores; 10 percent pebbles; few lime cutans on lower surfaces of pebbles; slight effervescence; moderately alkaline; clear smooth boundary.

Bk—24 to 32 inches; light brownish gray (2.5Y 6/2) sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; few roots; 10 percent pebbles; common lime cutans on lower surfaces of pebbles; strong effervescence; moderately alkaline; clear smooth boundary.

C—32 to 60 inches; light brownish gray (2.5Y 6/2) sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; few roots; disseminated lime; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 12 to 30 inches
Depth to the Bk horizon: 10 to 36 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5
Chroma: 2 or 3
Texture: loamy sand, sand, or loamy fine sand

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 3 to 6 moist
Chroma: 2 to 4
Texture: loamy fine sand, loamy sand, fine sand, or sand

C horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 or 3
Texture: loamy fine sand, loamy sand, fine sand, or sand

Littlemo Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over moderately rapid or rapid
Landform: Paleoterraces
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Littlemo silt loam, 2,500 feet south and 200 feet east of the northwest corner of sec. 33, T. 138 N., R. 102 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; neutral; abrupt smooth boundary.

Bw1—6 to 10 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular

blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; neutral; abrupt smooth boundary.

Bw2—10 to 17 inches; light olive brown (2.5Y 5/4) loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; neutral; clear smooth boundary.

Bk1—17 to 22 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; violent effervescence; moderately alkaline; clear smooth boundary.

Bk2—22 to 28 inches; light gray (2.5Y 7/2) clay loam, light yellowish brown (2.5Y 6/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few fine and medium irregularly shaped masses of carbonates; violent effervescence; moderately alkaline; clear wavy boundary.

2C1—28 to 34 inches; white (2.5Y 8/2) gravelly sandy clay loam, pale yellow (2.5Y 7/4) moist; single grain; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; about 15 percent gravel; few fine irregularly shaped masses of carbonates on undersides of pebbles; violent effervescence; moderately alkaline; clear wavy boundary.

2C2—34 to 60 inches; light yellowish brown (2.5Y 6/4) very gravelly coarse sandy loam, olive brown (2.5Y 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; about 40 percent gravel; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 13 to 20 inches
Depth to loamy-skeletal material: 20 to 40 inches
Notes: Textures of loamy coarse sand and loamy sand are below depths of 40 inches in some pedons.

A horizon:
Value: 4 or 5
Chroma: 2 or 3
Texture: silt loam or loam

Bw horizon:
Value: 4 or 5, 2 to 4 moist
Texture: silt loam or loam

Bk horizon:
Value: 5 to 7
Chroma: 2 to 4

2C horizon:
Value: 5 to 8, 3 to 7 moist
Texture: sandy clay loam, coarse sandy loam, or loam
Notes: Rock fragments range from 15 to 70 percent. It has textures of loamy coarse sand and loamy sand below depths of 40 inches in some pedons.

Livona Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Till plains
Parent material: Eolian over glacial till
Slope: 3 to 15 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Livona fine sandy loam, 1,570 feet west and 50 feet south of the northeast corner of sec. 29, T. 137 N., R. 76 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to weak fine granular; slightly hard, very friable, slightly sticky and nonplastic; many fine roots; many fine pores; neutral; gradual wavy boundary.

Bw—8 to 15 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; common fine roots; common fine pores; neutral; clear wavy boundary.

Bt1—15 to 19 inches; light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; strong medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; common fine roots; common pores; thin clay films of very dark grayish brown (10YR 3/2) on faces of prisms; neutral; clear wavy boundary.

2Bt2—19 to 24 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; strong coarse prismatic structure parting to moderate medium angular blocky; hard, firm, slightly sticky and slightly plastic; common fine roots; common fine pores; common thin clay films on faces of prisms; neutral; clear wavy boundary.

2Bk1—24 to 40 inches; light gray (2.5Y 7/2) clay loam, light yellowish brown (2.5Y 6/4) moist; weak coarse prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common fine pores; many medium masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

2Bk2—40 to 52 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; few medium distinct yellowish brown (10YR 5/6) dry redoximorphic concentrations; weak coarse and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few fine pores; 2 percent rock fragments; common white lime in threads and masses; strong effervescence; moderately alkaline; clear wavy boundary.

2C—52 to 60 inches; pale yellow (2.5Y 7/4) loam, light olive brown (2.5Y 5/4) moist; few very fine distinct yellowish brown (10YR 5/6) dry redoximorphic concentrations; massive; friable; 2 percent rock fragments; few masses and threads of lime; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 13 to 36 inches
Percent rock fragments: 2 to 8 percent in the glacial till
Depth to glacial till: 10 to 20 inches

A horizon:
Value: 3 or 4, 2 or 3 moist
Texture: fine sandy loam, sandy loam, or loam

Bw horizon:
Value: 3 to 5, 2 to 4 moist
Chroma: 2 to 4
Texture: fine sandy loam or sandy loam

Bt and 2Bt horizons:
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: sandy clay loam, loam, or clay loam

2Bk horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7
Chroma: 2 to 4

2C horizon:
Hue: 2.5Y or 5Y
Value: 4 to 7, 3 to 6 moist
Chroma: 2 to 4
Texture: loam or clay loam

Lohler Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Fine, smectitic, calcareous, frigid Vertic Ustifluvents

Typical pedon:
Lohler silty clay, 53 feet east and 53 feet south of the northwest corner of sec. 35, T. 140 N., R. 81 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 8 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse and medium subangular blocky structure parting to moderate fine granular; hard, firm, sticky and plastic; many fine roots; common fine pores; slight effervescence; slightly alkaline; abrupt smooth boundary.

C—8 to 60 inches; light brownish gray (2.5Y 6/2) stratified silty clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; common fine roots 8 to 30 inches, few fine 30 to 60 inches; common fine pores; some layers appear platy, but strong very fine angular blocky in other layers; 1/8 to 1/2 inch thick layers of light gray (2.5Y 7/2) silt below depths of 40 inches; slight effervescence; slightly alkaline.

Range in Characteristics

Salinity: The soil is saline in some map units.

Ap horizon:
Value: 5 or 6, 3 or 4 moist

C horizon:
Value: 5 or 6
Chroma: 2 to 4

Lonna Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Alluvial flats, alluvial fans, stream terraces, hills, and ridges
Parent material: Alluvium
Slope: 0 to 25 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-silty, mixed, superactive, frigid Aridic Haplustepts

Typical pedon:
Lonna silt loam, 100 feet east and 1,700 feet north of the southwest corner of sec. 28, T. 139 N., R. 101 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 2 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 18 percent clay; neutral; clear smooth boundary.

Bw—2 to 11 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 22 percent clay; strong effervescence; slightly alkaline; clear wavy boundary.

Bk1—11 to 17 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 21 percent clay; common fine rounded masses of lime; strong effervescence; moderately alkaline; clear wavy boundary

Bk2—17 to 34 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 21 percent clay; common fine rounded masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

C—34 to 60 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 22 percent clay; few fine rounded masses of lime; violent effervescence; moderately alkaline.

Range in Characteristics

Depth to the Bk horizon: 10 to 16 inches
Notes: Some pedons have a By horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 3 to 5 moist
Chroma: 2 to 4
Texture: silt loam or loam

Bw horizon:
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam

Bk horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam

C horizon:
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam

Makoti Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Lake plains
Parent material: Glaciolacustrine deposits
Slope: 0 to 3 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Pachic Haplustolls

Typical pedon:
Makoti silty clay loam, 190 feet east and 70 feet south of the northwest corner of sec. 15, T. 149 N., R. 87 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; dark gray (10YR 4/1) silty clay loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to moderate medium granular; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; neutral; abrupt smooth boundary.

Bw1—6 to 14 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate fine subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; common very fine and fine pores; slightly acid; clear wavy boundary.

Bw2—14 to 19 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate coarse prismatic structure parting to moderate fine subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; common very fine and fine pores; neutral; clear wavy boundary.

Bk1—19 to 26 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak very fine subangular blocky; slightly hard, friable, slightly sticky and nonplastic; few fine roots; common very fine and fine pores; violent effervescence; slightly alkaline; gradual wavy boundary.

Bk2—26 to 34 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure parting to weak very fine subangular blocky; slightly hard, friable, slightly sticky and nonplastic; few fine roots; common very fine and fine pores; violent effervescence; slightly alkaline; gradual wavy boundary.

C1—34 to 46 inches; olive yellow (2.5Y 6/6) stratified silt loam and very fine sandy loam, grayish brown (2.5Y 5/2) moist; many medium distinct gray (5Y 5/1) redoximorphic depletions; massive; slightly hard, friable, slightly sticky and nonplastic; few fine roots; common very fine and fine pores; fine rounded masses of lime; strong effervescence; slightly alkaline; gradual smooth boundary.

C2—46 to 60 inches; light brownish gray (2.5Y 6/2) stratified silty clay loam and very fine sandy loam, olive brown (2.5Y 4/4) moist; many medium distinct grayish brown (2.5Y 5/2) redoximorphic depletions; massive; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine pores; medium rounded masses of lime; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 24 inches
Notes: Some pedons do not have a C horizon. Some pedons have a BCk horizon.

Ap horizon:
Hue: 3 or 4, 2 or 3 moist

Bw horizon:
Value: 3 to 5, 2 to 4 moist

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 4

Maltese Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Very slow
Landform: Alluvial flats, alluvial fans, hills, and ridges
Parent material: Alluvium
Slope: 0 to 25 percent
Notes: These soils are sodic.

Taxonomic class: Fine, smectitic, frigid Torrertic Natrustolls

Typical pedon:
Maltese silt loam, 2,300 feet north and 1,700 feet west of the southeast corner of sec. 36, T. 138 N., R. 101 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 7 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky and weak fine platy; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; slightly acid; clear smooth boundary.

E—7 to 10 inches; light yellowish brown (2.5Y 6/3) silt loam, dark olive brown (2.5Y 3/3) moist; moderate coarse platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; slightly acid; abrupt smooth boundary.

Btn—10 to 16 inches; light olive brown (2.5Y 5/3) silty clay, dark olive brown (2.5Y 3/3) moist; strong medium columnar structure parting to strong fine angular blocky; extremely hard, extremely firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; many distinct clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btkn—16 to 20 inches; light yellowish brown (2.5Y 6/3) silty clay, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm, sticky and plastic; few very fine roots; common very fine tubular pores; common distinct clay films on faces of peds; common fine irregularly shaped masses of carbonates; violent effervescence; slightly alkaline; clear wavy boundary.

Btkny—20 to 33 inches; light yellowish brown (2.5Y 6/3) silty clay loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm, sticky and plastic; few very fine roots; common very fine tubular pores; common distinct clay films on faces of peds; many fine and medium irregularly shaped nests of gypsum; few fine rounded masses of carbonates; strong effervescence; strongly alkaline; gradual wavy boundary.

BCy—33 to 45 inches; light olive brown (2.5Y 5/3) silty clay loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; common fine irregularly shaped nests of gypsum; slight effervescence; strongly alkaline; gradual wavy boundary.

Cy—45 to 60 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine irregularly shaped nests of gypsum; slight effervescence; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 23 inches
Depth to lime: 7 to 20 inches
Depth to gypsum or other salts: 16 to 36 inches
Notes: Combined A and E horizons range from 4 to 12 inches thick. Some pedons have an AE horizon or a Bw horizon below the A horizon. Some pedons have a Btny horizon or a BCky horizon.

A horizon:
Chroma: 2 or 3
Texture: silt loam or loam

E horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 3 to 5 moist
Chroma: 2 to 4

Btn horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3
Texture: silty clay or clay

Btk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 or 3
Texture: silty clay loam, silty clay, clay loam, or clay

BCy horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 3 to 5 moist
Chroma: 2 to 4
Texture: silty clay loam, silt loam, or loam
Notes: It is fine sandy loam below a depth of 40 inches.

C horizon:
Hue: 2.5Y or 5Y
Value: 6 or 7, 4 or 5 moist
Chroma: 2 or 3
Notes: Some pedons have a loamy fine sand 2C horizon below a depth of 40 inches.

Manning Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid over very rapid
Landform: Stream terraces and escarpments
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Manning fine sandy loam, 2,040 feet west and 100 feet south of the northeast corner of sec. 15, T. 139 N., R. 97 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to moderate medium granular; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine pores; few pebbles; neutral; abrupt smooth boundary.

Bw1—5 to 12 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate coarse and medium prismatic structure parting to moderate medium subangular blocky; hard, very friable, slightly sticky and slightly plastic; common fine roots; many fine pores; few faint clay films on faces of peds; few pebbles; neutral; gradual wavy boundary.

Bw2—12 to 18 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; moderate coarse and medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common fine pores; few faint clay films on faces of prisms; few pebbles and cobbles; neutral; clear wavy boundary.

Bk—18 to 25 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; few

roots; common fine pores; about 10 percent gravel; violent effervescence; common fine masses of lime; moderately alkaline; clear wavy boundary.

2C1—25 to 40 inches; light yellowish brown (2.5Y 6/4) sand and gravel, olive brown (2.5Y 4/3) moist; single grain; loose; few fine roots; about 25 percent gravel coarser than 3/4 inch; few cobbles; thin coating of lime on undersides of some pebbles and cobbles; strong effervescence in upper part and slight effervescence in lower part; moderately alkaline; clear wavy boundary.

2C2—40 to 60 inches; light brownish gray (2.5Y 6/2) sand and strata of fine gravel, dark grayish brown (2.5Y 4/2) moist; single grain; loose; about 10 percent gravel; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 13 to 28 inches
Depth to sand and gravel: 24 to 40 inches

A horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3
Notes: Rock fragments range up to 3 percent.

Bw horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 2 to 4
Texture: fine sandy loam or loam
Notes: Rock fragments range from 1 to 10 percent.

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 8, 3 to 6 moist
Chroma: 2 or 3
Texture: fine sandy loam or loam
Notes: Rock fragments range from 2 to 15 percent.

2C horizon:
Hue: 2.5Y or 5Y
Value: 4 to 7, 3 to 6 moist
Chroma: 2 to 4
Texture: fine sand, loamy sand, coarse sand, sand, or loamy coarse sand
Notes: Rock fragments range up to 75 percent.

Marysland Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate over rapid
Landform: Drainageways
Parent material: Alluvium
Slope: 0 to 1 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Calciaquolls

Typical pedon:
Marysland loam, 900 feet east and 200 feet north of the southwest corner of sec. 4, T. 121 N., R. 40 W. (Colors are for moist soil unless otherwise stated.)

A—0 to 9 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure; very friable; many roots; slight effervescence; moderately alkaline; abrupt wavy boundary.

Ak—9 to 12 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; many roots; strong effervescence; moderately alkaline; abrupt wavy boundary.

Bkg1—12 to 15 inches; olive gray (5Y 4/2) loam; many fine faint olive gray (5Y 5/2) and dark gray (5Y 4/1) redoximorphic depletions; weak fine subangular blocky structure; very friable; few roots; strong effervescence; moderately alkaline; clear irregular boundary.

Bkg2—15 to 20 inches; olive gray (5Y 4/2) loam; few fine prominent olive yellow (2.5Y 6/6) redoximorphic concentrations; weak fine and medium subangular blocky structure; very friable; few dark brown (10YR 4/3) coatings in root channels; few small lime masses; strong effervescence; moderately alkaline; clear wavy boundary.

Bkg3—20 to 27 inches; light olive gray (5Y 6/2) loam; few fine prominent olive yellow (2.5Y 6/6) redoximorphic concentrations; weak medium and fine subangular blocky structure; friable; few grayish brown (2.5Y 5/2) root channel fillings; few small lime and dark-colored masses; strong effervescence; moderately alkaline; clear wavy boundary.

2Cg1—27 to 40 inches; grayish brown (2.5Y 5/2) sand; many fine and medium faint light brownish gray (2.5Y 6/2) and common medium prominent yellowish brown (10YR 5/8) redoximorphic concentrations; single grain; loose; slight effervescence; moderately alkaline; gradual wavy boundary.

2Cg2—40 to 60 inches; grayish brown (2.5Y 5/2) sand; many medium faint light brownish gray (2.5Y 6/2) redoximorphic depletions and few medium prominent red (2.5YR 4/8) redoximorphic concentrations; single grain; loose; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 24 inches
Depth to the calcic horizon: 0 to 12 inches
Depth to sand and gravel: 20 to 40 inches

A horizon:
Hue: 10YR, 2.5Y, 5Y, or neutral
Value: 2 or 3
Chroma: 0 or 1

Bkg horizon:
Hue: 10YR, 2.5Y, 5Y, or neutral
Value: 3 to 6, 4 to 7 dry
Chroma: 0 to 2

2Cg horizon:
Hue: 2.5Y or 5Y
Value: 3 to 6, 4 to 8 dry
Notes: It has 1 to 35 percent gravel.

Maschetah Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Alluvial flats, alluvial fans, hills, and ridges
Parent material: Alluvium
Slope: 0 to 15 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Calciustolls

Typical pedon:
Maschetah silt loam, 1,800 feet east and 1,125 feet south of the northwest corner of sec. 7, T. 146 N., R. 104 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 7 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; strong effervescence; slightly alkaline; clear smooth boundary.

Bk1—7 to 19 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; common fine masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

Bk2—19 to 34 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; common fine masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

Bk3—34 to 48 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; very hard, firm, sticky and plastic; few very fine roots; many very fine tubular pores; common fine masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

C—48 to 90 inches; pale yellow (2.5Y 7/4) silty clay loam, light olive brown (2.5Y 5/4) moist; massive; very hard, very firm, sticky and plastic; common very fine tubular pores; few fine masses of lime; violent effervescence; moderately alkaline.

Range in Characteristics

Notes: A calcareous Bw horizon up to 10 inches thick is allowed.

A horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Chroma: 2 to 4
Notes: Rock fragments range from 0 to 5 percent pebbles.

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 6 or 7, 4 or 5 moist

Chroma: 2 to 4
Texture: silt loam or silty clay loam
Notes: Rock fragments range from 0 to 5 percent pebbles.

Max Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Moraines
Parent material: Glacial till
Slope: 0 to 15 percent slopes

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Max loam, 2,350 feet north and 1,440 feet east of the southwest corner of sec. 29, T. 153 N., R. 80 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; about 2 percent gravel; neutral; clear wavy boundary.

Bw1—6 to 11 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, sticky and plastic; many very fine and common fine roots; about 2 percent gravel; slightly alkaline; gradual wavy boundary.

Bw2—11 to 16 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; moderate medium and coarse prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, sticky and plastic; common very fine roots; about 2 percent gravel; slightly alkaline; clear smooth boundary.

Bk1—16 to 26 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, firm, sticky and plastic; few very fine roots; about 5 percent gravel; disseminated lime throughout; strong effervescence; moderately alkaline; gradual smooth boundary.

Bk2—26 to 37 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; weak coarse subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; about 5 percent gravel; few fine irregularly shaped masses of lime; strong effervescence; moderately alkaline; gradual smooth boundary.

C—37 to 60 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; massive; hard, firm, sticky and plastic; few very fine roots; about 5 percent gravel; few fine irregularly shaped masses of lime; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Notes: Some pedons have a BCk horizon.

A horizon:
Value: 3 or 4, 2 or 3 moist

Bw horizon:
Value: 4 to 6
Chroma: 2 or 3

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4

C horizon:
Texture: loam or clay loam

Mckeen Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate
Landform: Floodplains
Parent material: Alluvium
Slope: 0 to 1 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, calcareous, frigid Typic Fluvaquents

Typical pedon:
Mckeen loam, 80 feet south and 230 feet east of the northwest corner of sec. 32, T. 137 N, R. 79 W. (Colors are for moist soil unless otherwise stated.)

A—0 to 2 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate very fine and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine pores; very slight effervescence; slightly alkaline; clear smooth boundary.

C—2 to 12 inches; stratified dark grayish brown (2.5Y 4/2) loam, light brownish gray (2.5Y 6/2) dry; many fine faint grayish brown (2.5Y 5/2) redoximorphic depletions and many fine prominent yellowish brown (10YR 5/8) redoximorphic concentrations; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine pores; slight effervescence; slightly alkaline; abrupt smooth boundary.

Ab—12 to 15 inches; very dark grayish brown (2.5Y 3/2) silty clay, grayish brown (2.5Y 5/2) dry; few fine prominent yellowish brown (10YR 5/8) redoximorphic concentrations; strong fine subangular blocky structure; hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine pores; slight effervescence; slightly alkaline; clear smooth boundary.

Cg1—15 to 23 inches; stratified olive gray (5Y 4/2) silty clay loam, olive gray (5Y 5/2) dry; few fine prominent dark yellowish brown (10YR 4/4) redoximorphic concentrations; massive; hard, firm, sticky and plastic; few very fine and fine roots; few very fine pores; slight effervescence; slightly alkaline; clear smooth boundary.

Cg2—23 to 45 inches; stratified dark olive gray (5Y 3/2) and olive gray (5Y 4/2) loam, olive gray (5Y 5/2) and light olive gray (5Y 6/2) dry; common fine distinct gray (5Y 5/1) redoximorphic depletions and common fine prominent dark

yellowish brown (10YR 4/4) redoximorphic concentrations; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine pores; slight effervescence; slightly alkaline; clear smooth boundary.

Cg3—45 to 54 inches; stratified olive gray (5Y 4/2) loam, olive gray (5Y 5/2) dry; many fine faint gray (5Y 5/1) redoximorphic depletions and many fine prominent dark yellowish brown (10YR 4/4) redoximorphic concentrations; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine pore; slight effervescence; slightly alkaline; clear smooth boundary.

Cg4—54 to 60 inches; stratified olive gray (5Y 4/2) loamy fine sand, light olive gray (5Y 6/2) dry; common fine faint gray (5Y 5/1) redoximorphic depletions and common fine prominent dark yellowish brown (10YR 4/4) redoximorphic concentrations; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine pores; very slight effervescence; slightly alkaline.

Range in Characteristics

Depth to lime: 0 to 6 inches
10 to 40 inch particle-size control section: Stratified with loam, silt loam, silty clay loam or clay loam textures averaging between 18 to 30 percent clay and more than 15 percent fine and coarser sand
Notes: Thin strata of coarser or finer textures are common. Some pedons have an O horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 2 to 4, 3 to 6 dry
Chroma: 1 or 2
Texture: loam, silt loam, silty clay loam or very fine sandy loam and less commonly fine sandy loam or silty clay

C and Cg horizons:
Value: 3 to 6, 4 to 7 dry
Chroma: 1 or 2
Texture: loam, silt loam, silty clay loam, or clay loam
Notes: Coarser or finer textures occur as thin strata or are below a depth of 40 inches.

Minnewaukan Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Rapid
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 3 percent

Taxonomic class: Mixed, frigid Typic Psammaquents

Typical pedon:
Minnewaukan loamy fine sand, 1,055 feet south and 150 feet west of the northeast corner of sec. 17, T. 151 N., R. 63 W. (Colors are for moist soil unless otherwise stated.)

A—0 to 3 inches; black (10YR 2/1) loamy fine sand, dark gray (10YR 4/1) dry; weak fine subangular blocky and granular structure; soft, very friable, slightly sticky

and nonplastic; many roots; about 1 percent gravel; slight effervescence; slightly alkaline; abrupt smooth boundary.

AC—3 to 5 inches; dark grayish brown and very dark grayish brown (2.5Y 4/2 and 2.5Y 3/2) loamy coarse sand, grayish brown (2.5Y 5/2) dry; single grain; nonsticky and nonplastic; many roots; about 15 percent gravel; slight effervescence; slightly alkaline; clear smooth boundary.

C—5 to 16 inches; dark grayish brown with olive brown (2.5Y 4/2 with 2.5Y 4/4) loamy sand, light brownish gray (2.5Y 6/2) dry; many fine distinct dark yellowish brown (10YR 4/4) redoximorphic concentrations; weak coarse prismatic structure parting to weak medium subangular blocky; soft, very friable, slightly sticky and nonplastic; few roots; about 1 percent gravel; slight effervescence; slightly alkaline; clear wavy boundary.

Cg1—16 to 28 inches; olive gray and olive (5Y 4/2 and 5Y 4/3) loamy sand, light gray and light olive gray (5Y 6/1 and 5Y 6/2) dry; very weak coarse prismatic structure; slightly sticky and nonplastic; few fine roots; about 10 percent pebbles; about 30 percent of sand and pebbles is shale fragments; few fine masses of lime; slight effervescence; slightly alkaline; clear wavy boundary.

Cg2—28 to 36 inches; olive gray and gray (5Y 5/2 and 5Y 5/1) fine sand, light gray (5Y 7/2) dry; single grain; nonsticky and nonplastic; about 1 percent gravel; slight effervescence; slightly alkaline; clear smooth boundary.

Cg3—36 to 50 inches; dark brown (10YR 3/3) fine sand, brown (10YR 4/3 and 10YR 5/3) dry; single grain; nonsticky and nonplastic; few small iron and manganese concretions; slight effervescence; moderately alkaline; clear smooth boundary.

Cg4—50 to 60 inches; olive (5Y 4/3) fine sand, pale olive (5Y 6/3) dry; single grain; nonsticky and nonplastic; slight effervescence; moderately alkaline.

Range in Characteristics

10 to 40 inch particle-size control section: Loamy fine sand, loamy sand, fine sand, or sand
Notes: Some pedons have horizons that contain 1 to 20 percent gravel.

A and AC horizons:
Hue: 10YR, 2.5Y, or 5Y
Value: 3 to 6

C horizon:
Hue: 10YR, 2.5Y, 5Y, or 5GY

Miranda Series

Depth class: Very deep
Drainage class: Moderately well or somewhat poorly drained
Permeability: Very slow
Landform: Till plains
Parent material: Glacial till
Slope: 0 to 6 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Leptic Natrustolls

Typical pedon:
Miranda loam, 264 feet south and 90 feet west of the northeast corner of sec. 22, T. 124 N., R. 66 W. (Colors are for dry soil unless otherwise stated.)

E—0 to 4 inches; light brownish gray (10YR 6/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to weak thin platy; hard, friable; neutral; abrupt smooth boundary.

Btn1—4 to 7 inches; grayish brown (10YR 5/2) clay loam, very dark brown (10YR 2/2) moist; strong fine and medium columnar structure; extremely hard, very firm, sticky and plastic; light brownish gray (10YR 6/2) coatings on tops of columns; slightly alkaline; abrupt smooth boundary.

Btn2—7 to 10 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium blocky; very hard, very firm, sticky and plastic; moderately alkaline; clear wavy boundary.

Btnz—10 to 16 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular; hard, firm, sticky and plastic; common fine accumulations of salts; strongly alkaline; abrupt wavy boundary.

Bkz—16 to 30 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct strong brown (7.5YR 5/8) moist redoximorphic concentrations; weak coarse blocky structure; hard, firm, sticky and plastic; common fine accumulations of salts; common fine accumulations of carbonate; strong effervescence; strongly alkaline; clear smooth boundary.

C1—30 to 38 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; few fine distinct strong brown (7.5YR 5/8) moist redoximorphic concentrations and common medium distinct light gray (10YR 7/1) moist redoximorphic depletions; massive; hard, firm, sticky and plastic; common fine streaks of salt and gypsum; common medium accumulations of carbonate; strong effervescence; strongly alkaline; clear smooth boundary.

C2—38 to 60 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; few fine distinct strong brown (7.5YR 5/8) moist redoximorphic concentrations and many fine distinct light gray (10YR 7/1) moist redoximorphic depletions; massive; hard, firm, sticky and plastic; few fine streaks of gypsum; common medium accumulations of carbonate; strong effervescence; strongly alkaline.

Range in Characteristics

Depth to lime: 5 to 25 inches
Depth to gypsum or other salts: 5 to 16 inches
Notes: The soil contains 1 to 10 percent rock fragments throughout. Some pedons have A horizons 1 to 4 inches thick with hue of 10YR, value of 3 to 5 and 2 or 3 moist, and chroma of 2. The combined thickness of the A and E horizon is 5 inches or less.

E horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 or 4 moist
Chroma: 1 or 2
Texture: loam or silt loam
Notes: The E horizon is absent in some pedons that have an Ap horizon.

Btn horizon:
Value: 3 to 6, 2 to 4 moist
Chroma: 1 to 4
Texture: clay loam, silty clay, or clay

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 3 to 7 and 3 to 6 moist
Chroma: 2 to 4

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 8, 3 to 7 moist
Chroma: 1 to 4
Texture: clay loam or loam but is fine sandy loam in some pedons
Notes: Some pedons have shale bedrock below a depth of 40 inches. Some pedons have thin strata of sandy loam and gravelly sand below a depth of 40 inches.

Moreau Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Landform: Ridges, hills, and pediments
Parent material: Residuum
Slope: 3 to 25 percent

Taxonomic class: Fine, smectitic, frigid Vertic Haplustolls

Typical pedon:
Moreau silty clay, 350 feet north and 200 feet east of the southwest corner of sec. 22, T. 129 N., R. 90 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; weak fine granular structure; slightly hard, friable, very sticky and very plastic; few very fine roots; slight effervescence; slightly alkaline; abrupt wavy boundary.

Bw—6 to 13 inches; light olive brown (2.5Y 5/3) silty clay, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm, very sticky and very plastic; few very fine roots; 1 to 2 inch wide cracks filled with A material throughout; strong effervescence; slightly alkaline; clear wavy boundary.

Bk—13 to 27 inches; light yellowish brown (2.5Y 6/3) silty clay, light olive brown (2.5Y 5/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, firm, very sticky and very plastic; 1 to 2 inch wide cracks filled with A material in upper 10 inches; common medium irregularly shaped masses of carbonates; violent effervescence; moderately alkaline; gradual wavy boundary.

BCk—27 to 35 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; slightly hard, firm, very sticky and very plastic; common olive yellow (2.5Y 6/6) iron stains; about 50 percent fine fragments of unweathered shale; few medium irregularly shaped masses of carbonates; strong effervescence; moderately alkaline; gradual wavy boundary.

Cr—35 to 60 inches; light olive gray (5Y 6/2) soft shale, olive gray (5Y 4/2) moist; common yellow (2.5Y 6/6) iron stains between bedrock laminations; slight effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 0 to 10 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have a By or C horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 2 or 3 moist
Texture: silty clay or clay

Bw horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 or 6, 3 to 5 moist
Chroma: 2 to 4
Texture: silty clay, clay, or silty clay loam
Notes: It typically averages between 45 and 55 percent clay.

Bk and BCk horizons:
Hue: 2.5Y or 5Y
Value: 5 or 6
Chroma: 1 to 3
Texture: silty clay, clay, or silty clay loam
Notes: They contain nests of gypsum in some pedons.

Cr horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 3 to 6 moist
Chroma: 2 to 4
Notes: It is laminated in some pedons and massive in others. It commonly has nests or lenses of gypsum.

Morton Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Landform: Pediments
Parent material: Residuum
Slope: 3 to 6 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Morton silt loam, 300 feet east and 60 feet south of the northwest corner of sec. 35, T. 141 N., R. 85 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure in the upper part and weak medium prismatic structure parting to moderate medium granular in the lower part; slightly hard, friable; many roots; few fine pores; neutral; clear wavy boundary.

Bt1—5 to 10 inches; dark brown (10YR 4/3) silty clay loam, very dark grayish brown (10YR 3/2) moist; very dark brown (10YR 2/2) moist coatings on faces of peds;

moderate medium prismatic structure parting to moderate medium and fine angular blocky; hard, friable; many roots; common fine pores; faint continuous clay films on faces of peds; neutral; gradual smooth boundary.

Bt2—10 to 15 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 4/3) moist; very dark grayish brown (10YR 3/2) moist coatings on faces of peds; moderate medium prismatic structure parting to moderate coarse to fine subangular blocky; hard, friable; common roots; many fine pores; faint patchy clay films on faces of peds; neutral; gradual smooth boundary.

Bk1—15 to 18 inches; light olive brown (2.5Y 5/4) silty clay loam, dark grayish brown (2.5Y 4/2) moist; few very dark grayish brown (10YR 3/2) moist coatings on faces of peds; moderate medium subangular blocky structure; hard, friable; common roots; many fine pores; few faint clay films on faces of peds; few masses of carbonates; slight effervescence; moderately alkaline; gradual smooth boundary.

Bk2—18 to 33 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure parting to weak coarse subangular blocky; hard, friable; few fine roots; common fine pores; many large masses of carbonates; violent effervescence; moderately alkaline; clear smooth boundary.

Cr—33 to 60 inches; soft consolidated siltstone and mudstone.

Range in Characteristics

Depth to lime: 11 to 30 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have a C horizon above the Cr horizon.

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3

Bt horizon:
Hue: 7.5YR, 10YR, or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 2 to 4
Texture: loam, silt loam, or silty clay loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 6 moist

Niobell Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Till plains
Parent material: Glacial till
Slope: 0 to 9 percent
Notes: These soils are sodic.

Taxonomic class: Fine, smectitic, frigid Glossic Natrustolls

Typical pedon:
Niobell loam, 2,215 feet north and 100 feet east of the southwest corner of sec. 25, T. 163 N., R. 97 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many fine pores; about 2 percent gravel; slightly acid; abrupt smooth boundary.

B/E—6 to 9 inches; light brownish gray (10YR 6/2) (E) and brown (10YR 4/3) (B) loam, dark grayish brown (10YR 4/2) (E) and dark brown (10YR 3/3) (B) moist; weak coarse prismatic (B) and moderate medium and fine platy (E) structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine pores; gray (10YR 6/1) dry patches of silt and sand grains on faces of peds; about 2 percent gravel; slightly acid; clear wavy boundary.

Btn1—9 to 13 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium and fine angular blocky; hard, firm, sticky and plastic; few very fine roots; common fine pores; many distinct very dark grayish brown (10YR 3/2) clay films on faces of peds and lining pores; tops and sides of upper 2 inches of prisms coated with patches of cleaned sand grains; about 2 percent gravel; neutral; gradual wavy boundary.

Btn2—13 to 19 inches; brown (10YR 5/3) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to strong medium and fine angular blocky; very hard, firm, sticky and plastic; few very fine roots; common fine pores; many distinct dark brown (10YR 3/3) clay films on faces of peds and lining pores; about 2 percent gravel; moderately alkaline; clear wavy boundary.

Bky1—19 to 22 inches; light olive brown (2.5Y 5/4) loam, olive brown (2.5Y 4/4) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; hard, friable, sticky and slightly plastic; common medium and fine crystals of gypsum; many large masses of lime; about 2 percent gravel; slight effervescence; moderately alkaline; gradual wavy boundary.

Bky2—22 to 29 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; weak medium and fine subangular blocky structure; hard, friable, sticky and slightly plastic; many fine crystals of gypsum; about 2 percent gravel; common medium and fine masses of lime; violent effervescence; strongly alkaline; gradual wavy boundary.

BCky—29 to 44 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/4) moist; massive; very hard, firm, sticky and slightly plastic; common fine crystals of gypsum; about 2 percent gravel; few fine masses of lime; strong effervescence; strongly alkaline; gradual wavy boundary.

C—44 to 60 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/4) moist; few fine distinct brown (10YR 5/3) relict redoximorphic concentrations and few fine prominent gray (5Y 5/1) relict redoximorphic depletions; massive; very hard, firm, sticky and slightly plastic; about 2 percent gravel; few small fragments of lignite; few gypsum crystals; few masses of lime; slight effervescence; strongly alkaline.

Range in Characteristics

Ap horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3

B/E horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 to 5 moist
Notes: Some cultivated pedons do not have a B/E horizon.

Btn horizon:
Value: 4 to 6
Chroma: 2 to 4

Bk horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam or clay loam

BCk horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam or clay loam
Notes: Some pedons do not have a BCk horizon.

Noonan Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landform: Till plains
Parent material: Glacial till
Slope: 0 to 9 percent
Notes: These soils are sodic.

Taxonomic class: Fine, smectitic, frigid Typic Natrustolls

Typical pedon:
Noonan loam, 1,850 feet south and 110 feet west of the northeast corner of sec. 35, T. 163 N., R. 97 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many fine pores; about 2 percent gravel; neutral; abrupt smooth boundary.

Btn1—6 to 9 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; strong coarse and medium columnar structure parting to moderate medium angular blocky; tops of columns capped with gray (10YR 6/1) dry loam; very hard, firm, sticky and plastic; few very fine roots; many distinct very dark brown (10YR 2/2) clay films on faces of peds and lining pores; about 2 percent gravel; strongly alkaline; clear wavy boundary.

Btn—9 to 12 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to strong medium angular blocky; very hard, firm, sticky and plastic; few very fine roots; few pores; faces of peds coated with brown (10YR 4/3) clay films; about 2 percent gravel; strongly alkaline; clear wavy boundary.

Bk—12 to 20 inches; light olive brown (2.5Y 5/3) clay loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate medium

subangular blocky; hard, friable, sticky and slightly plastic; few very fine roots; about 2 percent gravel; few medium masses of lime; few fine nests of gypsum in the lower part; strong effervescence; strongly alkaline; gradual wavy boundary.

Bky—20 to 28 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable, sticky and slightly plastic; few fine and medium roots; about 2 percent gravel; few fine nests of gypsum; common fine masses of lime; strong effervescence; strongly alkaline; gradual wavy boundary.

BCy—28 to 60 inches; light yellowish brown (2.5Y 6/3) and light olive brown (2.5Y 5/3) loam, olive brown (2.5Y 4/3) moist; weak coarse and medium subangular blocky structure; very hard, firm, sticky and slightly plastic; about 2 percent gravel; common medium nests of gypsum; slight effervescence; strongly alkaline.

Range in Characteristics

Depth to gypsum or other salts: more than 16 inches
Notes: Some pedons have an E or C horizon.

Ap horizon:
Value: 3 to 5, 2 or 3 moist

Btn horizon:
Hue: 10YR or 2.5Y
Value: 3 to 6, 2 to 4 moist
Chroma: 2 to 4

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4

BCy horizon:
Texture: loam or clay loam

Parnell Series

Depth class: Very deep
Drainage class: Very poor and poorly drained
Permeability: Slow
Landform: Depressions, swales, and drainageways
Parent material: Local alluvium
Slope: 0 to 1 percent

Taxonomic class: Fine, smectitic, frigid Vertic Argiaquolls

Typical pedon:
Parnell silty clay loam, 1,320 feet north and 35 feet west of the southeast corner of sec. 10, T. 125 N., R. 40 W. (Colors are for moist soil unless otherwise stated.)

A1—0 to 15 inches; black (10YR 2/1) silty clay loam, black (10YR 2/1) dry; moderate very fine and fine subangular blocky structure; friable; common roots; few fine distinct dark brown (7.5YR 3/2) and few fine prominent reddish brown (5YR 4/4) iron concentrations; neutral; clear smooth boundary.

A2—15 to 22 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium platy structure parting to weak very fine subangular

blocky; friable; few roots; few patchy gray (10YR 6/1) coatings on faces of peds when dry; slightly acid; clear smooth boundary.

Btg1—22 to 32 inches; black (10YR 2/1) silty clay loam, Very dark gray (10YR 3/1) dry; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few roots; many thin coatings of clean sand and silt particles on faces of peds; few faint black (10YR 2/1) clay films on faces of peds; slightly acid; gradual smooth boundary.

Btg2—32 to 55 inches; black (10YR 2/1) grading to very dark gray (10YR 3/1) silty clay, very dark gray (10YR 3/1) dry; weak medium prismatic structure parting to strong angular blocky; firm; many faint black (10YR 2/1) clay films on faces of peds; slightly acid in upper part grading to neutral in lower part; diffuse wavy boundary.

BCg—55 to 80 inches; grayish brown (2.5Y 5/2) grading to olive gray (5Y 5/2) in the lower part, silty clay loam; weak very fine angular blocky structure; firm in upper part and friable in lower part; few strata of loam and silty clay; few distinct black (10YR 2/1) and very dark gray (10YR 3/1) clay films in upper part; common fine prominent reddish brown (5YR 4/4) Fe concentrations and common fine faint dark grayish brown (2.5Y 4/2) Fe depletions; neutral in upper part becoming slightly alkaline; slight effervescence in lower part.

Range in Characteristics

Mollic epipedon thickness: 24 to 80 inches
Depth to lime: 35 to over 80 inches
Notes: Pedons typically do not have rock fragments, but some pedons contain as much as 8 percent, by volume, in the lower part of the B horizon and in the C horizon. Some pedons have an 0a horizon as much as 6 inches thick. The mollic epipedon includes all or part of the B horizon. Some pedons have an E horizon as much as 4 inches thick. Some pedons have a Bk horizon.

A horizon:
Hue: 10YR to 5Y or is neutral
Chroma: 0 or 1
Texture: silty clay loam but the range includes silt loam, loam, and silty clay

Btg horizon:
Hue: 10YR to 5Y
Value: 2 to 4
Chroma: 1 or 2
Texture: silty clay or silty clay loam but the range includes clay loam or clay
Notes: It typically averages between 40 and 45 percent clay and ranges from 35 to 60 percent and as much as 30 percent sand.

BCg horizon:
Hue: 10YR to 5Y
Value: 3 to 6
Chroma: 1 or 2 or less commonly 3 or 4
Texture: loam, clay loam, silty clay loam, silty clay, or clay

Cg horizon:
Hue: 10YR to 5Y
Value: 3 to 7
Chroma: 1 or 2 or less commonly 3 or 4
Texture: loam, clay loam, silty clay loam, silty clay, or clay

Parshall Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Alluvial flats, alluvial fans, swales, ridges, hills, and stream terraces
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls

Typical pedon:
Parshall fine sandy loam, 1,550 feet north and 950 feet east of southwest corner of sec. 33, T. 139 N., R. 81 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and few fine pores; neutral; abrupt smooth boundary.

A—7 to 12 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine and few medium roots; many fine and very fine and few medium pores; neutral; clear wavy boundary.

Bw1—12 to 20 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine and fine and few medium pores; slightly alkaline; clear wavy boundary.

Bw2—20 to 29 inches; light olive brown (2.5Y 5/3) fine sandy loam, dark olive brown (2.5Y 3/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine and few fine pores; neutral; abrupt smooth boundary.

Bk1—29 to 42 inches; grayish brown (2.5Y 5/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine and few fine pores; few fine filaments of lime; strong effervescence; moderately alkaline; clear smooth boundary.

Bk2—42 to 48 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; soft, very friable, slightly sticky and nonplastic; few fine and very fine roots; common very fine pores; common fine filaments of lime; strong effervescence; moderately alkaline; abrupt wavy boundary.

BCk—48 to 60 inches; light yellowish brown (2.5Y 6/3) loamy fine sand, olive brown (2.5Y 4/3) moist; weak coarse subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few fine and very fine roots; few very fine pores; few fine irregularly shaped masses and common fine filaments of lime; violent effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches
Notes: Some pedons have an Ab horizon below a depth of 50 inches. Some pedons have a C horizon.

A horizon:
Value: 3 or 4
Texture: fine sandy loam or loam

Bw horizon:
Chroma: 2 to 4

Bk horizon:
Hue: 10YR or 2.5Y
Texture: fine sandy loam or loamy fine sand

Patent Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Alluvial fans
Parent material: Alluvium
Slope: 0 to 25 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents

Typical pedon:
Patent loam, 1,850 feet east and 50 feet north (of road edge) of the southwest corner of sec. 1, T. 139 N., R. 101 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 1 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak very fine granular structure; soft, very friable; many fine roots; many fine pores; slightly alkaline; gradual wavy boundary.

AC—1 to 7 inches; light brownish gray (2.5Y 6/2) loam, olive brown (2.5Y 4/4) moist; weak medium subangular blocky and weak fine platy structure; hard, very friable; common fine roots; few fine pores; slight effervescence; moderately alkaline; clear smooth boundary.

C—7 to 60 inches; light yellowish brown (2.5Y 6/3) thinly stratified loam, very fine sandy loam and clay loam, olive brown (2.5Y 4/3) moist; massive but parts to weak plates along the laminae; hard, friable; few fine roots; few fine pores; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 0 to 10 inches
10 to 40 inch particle-size control section: 18 to 35 percent clay
Notes: Strata of contrasting texture less than 2 inches thick are common. Some pedons contain rock fragments and porcelanite material.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 to 5 moist
Chroma: 1 to 3
Texture: loam or silt loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 6 or 7, 4 or 5 moist
Chroma: 2 to 4
Texture: stratified loam, fine sandy loam, clay loam, very fine sandy loam, or silty clay loam

Peta Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Alluvial flats
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Pachic Argiustolls

Typical pedon:
Peta loam, 2,150 feet east and 1,900 feet south of the northwest corner of sec. 23, T. 142 N., R. 99 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; 18 percent clay; neutral; clear smooth boundary.

A—5 to 10 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots throughout; common very fine tubular pores; 18 percent clay; neutral; clear smooth boundary.

Bt1—10 to 20 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; moderately hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; 25 percent clay; few distinct discontinuous very dark grayish brown (10YR 3/2) clay films throughout; common fine rounded distinct dark yellowish brown (10YR 4/6) dry redoximorphic concentrations from 16 to 20 inches; neutral; clear wavy boundary.

Bt2—20 to 26 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; moderately hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; 23 percent clay; few distinct discontinuous dark brown (10YR 3/3) clay films throughout; common fine rounded prominent strong brown (7.5YR 4/6) dry redoximorphic concentrations throughout; neutral; clear wavy boundary.

BC—26 to 36 inches; light olive brown (2.5Y 5/4) fine sandy loam, olive brown (2.5Y 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine roots throughout; common very fine tubular pores; 15 percent clay; common fine rounded prominent strong brown (7.5YR 4/6) dry redoximorphic concentrations throughout; neutral; gradual wavy boundary.

C1—36 to 48 inches; light olive brown (2.5Y 5/4) fine sandy loam, brown (2.5Y 4/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots throughout; common very fine tubular pores; 11 percent clay; common fine rounded prominent strong brown (7.5YR 4/6) dry redoximorphic concentrations throughout and common fine rounded prominent light olive gray (5Y 6/2) dry redoximorphic depletions throughout; slightly alkaline; gradual wavy boundary.

C2—48 to 53 inches; light yellowish brown (2.5Y 6/3) loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; 18 percent clay; common fine rounded prominent strong brown (7.5YR 4/6) dry redoximorphic concentrations throughout and common fine rounded distinct light olive gray (5Y 6/2) dry redoximorphic depletions throughout; common fine rounded masses of lime pedogenic throughout; strong effervescence; moderately alkaline; gradual wavy boundary.

C3—53 to 80 inches; light brownish gray (2.5Y 6/2) fine sandy loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and nonplastic; 9 percent clay; common fine rounded prominent strong brown (7.5YR 4/6) dry redoximorphic concentrations throughout; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches
Percent rock fragments: less than 1 percent
Depth to redoximorphic features: 7 to 32 inches

A horizon:
Value: 3 or 4, 2 or 3 moist
Chroma: 1 to 3

Bt horizon:
Chroma: 2 to 4
Texture: loam, clay loam, or sandy clay loam

BC horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4
Texture: fine sandy loam, sandy loam, or sandy clay loam

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7
Texture: fine sandy loam, loam, sandy loam, or loamy sand

Reeder Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Landform: Pediments and ridges
Parent material: Residuum
Slope: 0 to 15 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Reeder loam, 1,575 feet south and 475 feet west of the northeast corner of sec. 14, T. 129 N., R. 100 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse and fine subangular blocky structure parting to weak fine granular; friable; many roots; many fine pores; neutral; abrupt smooth boundary.

Bt1—8 to 12 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate coarse and medium prismatic and moderate medium angular blocky structure; friable; common roots, many fine pores; many faint clay films on vertical faces of peds; many clay films on horizontal faces of peds; neutral; clear smooth boundary.

Bt2—12 to 17 inches; brown (10YR 5/3) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic and moderate medium angular blocky structure; friable; many clay films on faces of peds; neutral; gradual wavy boundary.

Bk1—17 to 32 inches; light brownish gray (2.5Y 6/3) loam, dark grayish brown (2.5Y 4/3) moist; weak coarse and medium prismatic and moderate medium subangular blocky structure; friable; few roots; many fine pores; common masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

Bk2—32 to 36 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; weak medium subangular blocky structure; friable; few fine roots; many fine threads of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

Cr—36 to 60 inches; pale yellow (5Y 7/3) soft sandstone and siltstone, olive (5Y 5/3) moist; few masses of lime; slight effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have a stratified loam, clay loam, or silty clay loam C horizon.

Ap horizon:
Value: 3 to 5, 2 or 3 moist

Bt horizon:
Hue: 7.5YR, 10YR, or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4

Bk horizon:
Notes: Some pedons do not have a Bk horizon.

Regan Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Drainageways and rim of depressions
Parent material: Alluvium

Slope: 0 to 3 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Calciaquolls

Typical pedon:
Regan silty clay loam, 1,650 feet south and 1,000 feet east of the northwest corner of sec. 34, T. 144 N., R. 78 W. (Colors are for moist soil unless otherwise stated.)

A1—0 to 4 inches; very dark gray (2.5Y 3/1) silty clay loam, dark gray (2.5Y 4/1) dry; moderate fine granular structure; hard, friable, slightly sticky and slightly plastic; many roots; slight effervescence; moderately alkaline; clear wavy boundary.

A2—4 to 9 inches; very dark gray (5Y 3/1) silty clay loam, gray (5Y 5/1) dry; strong fine and very fine subangular blocky structure parting to strong fine granular; hard, friable, sticky and slightly plastic; common roots; strong effervescence; moderately alkaline; clear very wavy boundary.

Bkg1—9 to 16 inches; gray (5Y 5/1) silty clay loam, light gray (5Y 6/1) dry; moderate medium granular structure; very hard, friable, sticky and slightly plastic; common roots; violent effervescence; moderately alkaline; gradual wavy boundary.

Bkg2—16 to 28 inches; dark gray (5Y 4/1) silty clay loam, gray (5Y 5/1) dry; massive; extremely hard, firm; few roots; violent effervescence; moderately alkaline; gradual wavy boundary.

2Cg1—28 to 54 inches; olive gray (5Y 4/2) clay loam, gray (5Y 5/1) dry; massive; extremely hard, friable; few roots; few pores; few salt crystals; strong effervescence; moderately alkaline; clear smooth boundary.

2Cg2—54 to 60 inches; olive gray (5Y 4/2) sandy clay loam, gray (5Y 5/1) dry; few fine distinct dark yellowish brown (10YR 4/4) redoximorphic concentrations; massive; stratified with clay loam and sandy loam layers; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

A horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 2 or 3
Chroma: 1 or 2
Texture: silt loam or loam

Bkg horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 3 to 6, 4 to 7 dry
Chroma: 1 or 2
Texture: silt loam or silty clay loam

2Cg horizon:
Value: 3 to 5, 5 to 7 dry
Chroma: 1 to 4

Regent Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow

Landform: Pediments, hills, knolls, and ridges
Parent material: Residuum
Slope: 0 to 25 percent

Taxonomic class: Fine, smectitic, frigid Vertic Argiustolls

Typical pedon:
Regent silty clay loam, northwest corner of sec. 3, T. 139 N., R. 97 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 10 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky and moderate fine granular structure; firm, plastic; common fine roots; common fine pores; neutral; clear smooth boundary.

Bt1—10 to 18 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure separating to strong fine angular blocky; firm, plastic; few roots; common fine pores; dark grayish brown (10YR 4/2) dry clay films on faces of peds; slightly alkaline; clear wavy boundary.

Bt2—18 to 26 inches; dark grayish brown (2.5Y 4/2) silty clay, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure separating to moderate medium subangular blocky; firm, plastic; few roots; common very fine pores; faint clay films on faces of peds; few faint white masses of lime; slightly alkaline; gradual wavy boundary.

Bk—26 to 39 inches; pale olive (5Y 6/3) silty clay loam, olive (5Y 5/3) moist; weak coarse prismatic structure separating to moderate medium subangular blocky; firm, plastic; few fine pores; common fine threads and few masses of lime; strong effervescence; moderately alkaline; clear wavy boundary.

Cr—39 to 62 inches; pale olive (5Y 6/3) dry soft shale; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to soft bedrock: 24 to 40 inches

Ap horizon:
Value: 4 or 5, 2 or 3 moist

Bt horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 2 to 4 moist
Chroma: 2 to 4

Bk horizon:
Notes: Some pedons do not have a Bk horizon.

Cr horizon:
Notes: It is soft siltstone or shale.

Rhame Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Pediments, hills, escarpments, and ridges
Parent material: Residuum
Slope: 1 to 50 percent

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical pedon:
Rhame fine sandy loam, 2,030 feet north and 260 feet east of the southwest corner of sec. 16, T. 131 N., R. 106 W. (Colors are for dry soil unless otherwise stated.)

A1—0 to 3 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many very fine roots, almost matted; neutral; clear wavy boundary.

A2—3 to 8 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; slightly hard, very friable; many very fine roots; neutral; gradual wavy boundary.

Bw—8 to 19 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; slightly hard, very friable; many fine roots; neutral; gradual wavy boundary.

BC—19 to 26 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, olive brown (2.5Y 4/4) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; slightly hard, very friable; common very fine roots; neutral; clear wavy boundary.

C—26 to 34 inches; pale yellow (2.5Y 7/3) fine sandy loam, light olive brown (2.5Y 5/4) moist; weak coarse and medium subangular blocky structure; hard, very friable; common very fine roots; few fine specks of carbonates; slight effervescence; moderately alkaline; clear wavy boundary.

Cr—34 to 60 inches; pale yellow (5Y 7/3) very soft bedded sandstone, olive (5Y 5/3) moist; massive; slightly hard and hard in strata and brittle when dry, very friable; strong effervescence.

Range in Characteristics

Mollic epipedon thickness: 7 to 14 inches
Depth to lime: 10 to 30 inches
Depth to the soft bedrock: 20 to 40 inches
10 to 40 inch particle-size control section: fine sandy loam or sandy loam.

A horizon:
Value: 4 or 5
Chroma: 2 or 3
Texture: fine sandy loam or sandy loam

Bw and BC horizons:
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: fine sandy loam or sandy loam

C horizon:
Texture: fine sandy loam or sandy loam
Notes: It does not have lime in some pedons.

Rhoades Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Very slow
Landform: Alluvial flats, alluvial fans, stream terraces, and ridges

Parent material: Alluvium
Slope: 0 to 9 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Leptic Vertic Natrustolls

Typical pedon:
Rhoades silt loam, 350 feet south and 125 feet east of the northwest corner of sec. 16, T. 131 N., R. 96 W. (Colors are for dry soil unless otherwise stated.)

E—0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate thin and medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine and few coarse roots; common fine and few coarse pores; slightly acid; abrupt smooth boundary.

Btn—3 to 8 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; strong medium columnar structure parting to strong fine and very fine angular blocky; extremely hard, very firm, very sticky and very plastic; common fine roots on faces of peds; common fine pores; light brownish gray (10YR 6/2) coatings on tops of columns; many faint clay films on faces of peds; moderately alkaline; clear wavy boundary.

Btknyz—8 to 14 inches; grayish brown (2.5Y 5/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; moderate coarse prismatic structure parting to moderate fine angular blocky; very hard, very firm, very sticky and very plastic; common fine roots on faces of peds; common fine pores; common faint clay films on faces of peds; common fine flecks of gypsum and other salt crystals; few fine masses of carbonates; strong effervescence; strongly alkaline; gradual wavy boundary.

Bkyz—14 to 24 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, very firm, very sticky and very plastic; common fine roots; common fine pores; few faint clay films on faces of peds; common fine flecks of gypsum and other salt crystals; few fine masses of carbonates; strong effervescence; strongly alkaline; gradual wavy boundary.

Bky1—24 to 40 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; very hard, very firm, very sticky and very plastic; few fine roots; common fine pores; common fine gypsum accumulations; common fine masses of carbonates; strong effervescence; strongly alkaline; gradual wavy boundary.

Bky2—40 to 46 inches; light yellowish brown (2.5Y 6/4) silty clay, light olive brown (2.5Y 5/4) moist; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; weak coarse subangular structure; hard, firm, very sticky and very plastic; few fine pores; few fine gypsum accumulations; common fine masses of carbonates; strong effervescence; strongly alkaline; clear wavy boundary.

C—46 to 60 inches; pale yellow (2.5Y 7/4) stratified silt loam and silty clay loam, light yellowish brown (2.5Y 6/4) moist; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; massive; hard, firm, sticky and plastic; few fine masses of carbonates; violent effervescence; strongly alkaline.

Range in Characteristics

Notes: Some pedons have a thin A horizon. Combined A and E horizon thickness is 1 to 5 inches.

E horizon:
Value: 4 to 6, 2 to 5 moist
Chroma: 2 or 3
Texture: loam or silt loam

Btn horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, 2 to 4 moist
Chroma: 2 or 3
Texture: silty clay loam, clay loam, clay, or silty clay

Bky horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 7, 3 to 5 moist
Chroma: 2 to 4
Texture: clay loam, loam, silty clay loam, silty clay, or clay
Notes: It does not have gypsum in some pedons.

C horizon:
Hue: 10YR, 5Y, or 2.5Y
Value: 4 to 7, 3 to 6 moist
Chroma: 1 to 4
Texture: silt loam, loam, clay loam, silty clay loam, silty clay, or clay
Notes: It has salt or gypsum in some pedons. Some pedons do not have C horizon within a depth of 60 inches.

Ridgelawn Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over rapid
Landform: Floodplains and low terraces
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, calcareous, frigid Typic Ustifluvents

Typical pedon:
Ridgelawn silt loam, 2,500 feet north and 140 feet east of the southwest corner of sec. 6, T. 21 N., R. 59 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 9 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse subangular blocky structure parting to moderate medium granular; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; slightly effervescent throughout (HCl, 1 normal); moderately alkaline (pH 8.0); abrupt boundary.

C1—9 to 20 inches; light brownish gray (2.5Y 6/2) stratified silt loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, moderately sticky and moderately plastic; stratifications 1 to 2 mm thick; common very fine roots throughout; common fine irregular yellowish brown (10YR 5/6) iron concretions pedogenic throughout; slightly effervescent throughout (HCl, 1 normal); moderately alkaline; clear smooth boundary.

C2—20 to 25 inches; light brownish gray (2.5Y 6/2) stratified silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, moderately sticky and

moderately plastic; stratifications 1 to 2 mm thick; few very fine roots throughout; few irregular yellowish brown (10YR 5/6) iron concretions pedogenic throughout; strongly effervescent throughout (HCl, 1 normal); moderately alkaline; clear smooth boundary.

C3—25 to 29 inches; light brownish gray (2.5Y 6/2) stratified loam and silt loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, moderately sticky and moderately plastic; stratifications 1 to 2 mm thick; few very fine roots throughout; strongly effervescent throughout (HCl, 1 normal); moderately alkaline; abrupt smooth boundary.

2C4—29 to 49 inches; light brownish gray (2.5Y 6/2) fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; stratifications 1 to 2 mm thick; organic matter or coal strata 1 mm thick throughout; slightly effervescent throughout (HCl, 1 normal); moderately alkaline; abrupt smooth boundary.

2C5—49 to 57 inches; light brownish gray (2.5Y 6/2) stratified loamy fine sand, grayish brown (2.5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; stratifications 1 to 2 mm thick; slightly effervescent throughout (HCl, 1 normal); moderately alkaline; clear smooth boundary.

2C6—57 to 70 inches; light brownish gray (2.5Y 6/2) stratified loamy sand, grayish brown (2.5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; stratifications 1 to 2 mm thick; slightly effervescent throughout (HCl, 1 normal); moderately alkaline; clear smooth boundary.

2C7—70 to 80 inches; light brownish gray (2.5Y 6/2) sand, grayish brown (2.5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; strata of coal 1-5 mm thick throughout; very slightly effervescent throughout (HCl, 1 normal); moderately alkaline.

Range in Characteristics

Depth to the 2C horizon: 20 to 40 inches.

Ap horizon:
Hue: 5Y, 2.5Y, or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 1 to 3

C horizon:
Hue: 5Y, 2.5Y, or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 1 to 3
Notes: This horizon has 15 to 35 percent fine sand and coarser.

2C horizon:
Hue: 5Y, 2.5Y, or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 1 to 3
Notes: This horizon has up to 35 percent gravel. Textures of sand are allowed below depths of 40 inches.

Ringling Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Moderately rapid over rapid

Landform: Pediments
Parent material: Residuum
Slope: 2 to 6 percent

Taxonomic class: Loamy-skeletal over fragmental, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Ringling loam, 2,600 feet west and 700 feet south of the northeast corner of sec. 22, T. 3 S., R. 42 E. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; reddish brown (5YR 4/3) loam, dark reddish brown (5YR 3/3) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; common medium fine and very fine roots; 30 percent channers; slightly alkaline; clear smooth boundary.

Bw—5 to 17 inches; reddish brown (5YR 4/4) very channery loam, dark reddish brown (2.5YR 3/4) moist; weak very fine subangular blocky structure; soft, friable, nonsticky and nonplastic; common medium, fine, and very fine roots; 50 percent channers and 5 percent flagstones; slightly alkaline; clear smooth boundary.

2Ck—17 to 42 inches; pale red (10R 6/3) dry, highly fractured baked sandstone and shale with less than 5 percent fine material in the voids; few medium, fine, and very fine roots along faces of fragments mainly in the upper part; lime casts on coarse fragments mainly in the upper part; gradual wavy boundary.

3C—42 to 60 inches; pale red (10R 6/3) dry, highly fractured baked sandstone; less than 3 percent fine material in the voids.

Range in Characteristics

Mollic epipedon thickness: 7 to 14 inches thick
Depth to fragmental material: 12 to 20 inches

A horizon:
Hue: 7.5YR, 5YR, 2.5YR, or 10R
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Notes: Rock fragments range from 10 to 80 percent. It consists of 0 to 15 percent flagstones and 10 to 65 percent channers.

Bw horizon:
Hue: 7.5YR, 5YR, 2.5YR, or 10R
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4
Notes: Rock fragments range from 35 to 80 percent. It consists of 5 to 25 percent flagstones and 30 to 55 percent channers.

2Ck and 3C horizons:
Notes: Rock fragments range from 95 to 100 percent. It consists of 90 to 95 percent flagstones and 5 to 10 percent channers.

Roseglen Series

Depth class: Very deep
Drainage class: Well or moderately well drained
Permeability: Moderate
Landform: Glacial lake plains

Parent material: Glaciolacustrine sediments
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Pachic Haplustolls

Typical pedon:
Roseglen silt loam, 2,525 feet east and 1,990 feet north of the southwest corner of sec. 29, T. 139 N., R. 78 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; soft, very friable, slightly sticky and slightly plastic; neutral; abrupt smooth boundary.

Bw1—7 to 14 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; neutral; irregular wavy boundary.

Bw2—14 to 21 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; moderate coarse and medium prismatic structure parting to weak medium angular blocky; slightly hard, friable, slightly sticky and slightly plastic; neutral; clear wavy boundary.

Bw3—21 to 24 inches; brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; moderate coarse and medium prismatic structure parting to weak medium angular blocky; slightly hard, friable, slightly sticky and slightly plastic; mildly alkaline; gradual wavy boundary.

Bk—24 to 34 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak coarse prismatic structure parting to weak medium angular blocky; hard, firm, sticky and plastic; many masses of carbonates; violent effervescence; moderately alkaline; gradual irregular boundary.

C1—34 to 53 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak coarse prismatic structure; hard, firm, slightly sticky and slightly plastic; strong effervescence; slightly alkaline; abrupt irregular boundary.

C2—53 to 60 inches; laminated very pale brown (10YR 8/4) silt loam, dark grayish brown (10YR 4/2) moist; few large distinct light gray (10YR 7/1) and few medium prominent reddish yellow (7.5YR 6/8) mottles; massive; slightly hard, firm, slightly sticky and slightly plastic; many fine pores; few masses of carbonates; strong effervescence; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 36 inches
Depth to lime: 15 to 30 inches
Notes: A wide variety of textures and kinds of material are below depths of 40 inches.

A horizon:
Value: 3 to 5, 2 or 3 moist
Texture: silt loam or loam

Bw horizon:
Value: 3 to 5
Chroma: 2 or 3
Texture: silt loam or loam

Bk horizon:
Hue: 10YR or 2.5Y

Value: 6 or 7, 4 or 5 moist
Chroma: 1 to 3
Texture: silt loam or loam

C horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6 moist
Chroma: 1 to 4
Texture: silt loam or loam
Notes: Textures below a depth of 40 inches range from gravelly sand to clay.

Sakakawea Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Lake plains
Parent material: Glaciolacustrine deposits
Slope: 3 to 6 percent
Notes: These soils are highly calcareous.

Taxonomic class: Coarse-silty, mixed, superactive, frigid Typic Calciustolls

Typical pedon:
Sakakawea loam, 2,425 feet west and 1,500 feet south of the northeast corner of sec. 23, T. 158 N., R. 93 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; strong effervescence; slightly alkaline; abrupt smooth boundary.

Bk1—6 to 14 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and plastic; few very fine roots; many fine irregular masses of lime; violent effervescence; moderately alkaline; clear wavy boundary.

Bk2—14 to 21 inches; light yellowish brown (2.5Y 6/4) silt loam, olive brown (2.5Y 4/4) moist; hard, friable, slightly sticky and plastic; few very fine roots; few fine irregular masses of lime; violent effervescence; moderately alkaline; clear smooth boundary.

C1—21 to 29 inches; stratified light brownish gray (2.5Y 6/2) and light yellowish brown (2.5Y 6/4) silt loam, grayish brown (2.5Y 5/2) and olive brown (2.5Y 4/4) moist; few fine prominent strong brown (7.5YR 5/6) relict redoximorphic concentrations; massive; slightly hard, friable, slightly sticky and plastic; few very fine roots; few fine filaments of lime; strong effervescence; moderately alkaline; abrupt smooth boundary.

C2—29 to 41 inches; stratified light brownish gray (2.5Y 6/2) and pale yellow (2.5Y 7/4) loam, grayish brown (2.5Y 5/2) and light olive brown (2.5Y 5/4) moist; few fine prominent strong brown (7.5YR 5/6) relict redoximorphic concentrations; massive; slightly hard, friable, slightly sticky and slightly plastic; disseminated lime throughout; strong effervescence; moderately alkaline; abrupt smooth boundary.

C3—41 to 60 inches; stratified light brownish gray (2.5Y 6/2) silty clay loam and pale yellow (2.5Y 7/4) loamy sand, grayish brown (2.5Y 5/2) and light yellowish brown (2.5Y 6/4) moist; few fine prominent strong brown (7.5YR 5/6) relict redoximorphic concentrations; massive; slightly hard, friable, slightly sticky and slightly plastic; disseminated lime throughout; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 10 inches
Depth to lime: 0 to 7 inches

Ap horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 1 to 3
Texture: loam, clay loam, silt loam, or silty clay loam

Bk horizon:
Value: 5 to 8, 4 to 6 moist
Chroma: 2 to 4

C horizon:
Value: 5 to 8
Texture: loam or silt loam in the upper part and silty clay, silty clay loam, silt loam, loam, very fine sandy loam, fine sandy loam, loamy sand, or loamy fine sand in distinct layers in the lower part.

Savage Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Alluvial flats, alluvial fans, hills, terraces, ridges, divides, and knolls
Parent material: Alluvium
Slope: 0 to 9 percent

Taxonomic class: Fine, smectitic, frigid Vertic Argiustolls

Typical pedon:
Savage silty clay loam, 280 feet south and 395 feet east of the northwest corner of sec. 13, T. 132 N., R. 92 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; moderate very fine and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; neutral; abrupt smooth boundary.

A—5 to 7 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure parting to moderate very fine and fine granular; hard, firm, slightly sticky and slightly plastic; many very fine roots; neutral; clear wavy boundary.

Bt1—7 to 11 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate very fine subangular blocky; slightly hard, friable, very sticky and very plastic; many very fine roots; many faint clay films on faces of peds; neutral; clear wavy boundary.

Bt2—11 to 18 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate very fine subangular blocky; hard, firm, very sticky and very plastic; common very fine roots; common distinct clay films on faces of peds; mildly alkaline; gradual wavy boundary.

Bt3—18 to 25 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak very fine and fine subangular blocky; hard, firm, very sticky and very plastic; common very fine roots; common distinct clay films on faces of peds; mildly alkaline; abrupt smooth boundary.

Bk1—25 to 36 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; hard, firm, sticky and plastic; common very fine roots; very few distinct clay films on faces of peds; common medium irregularly shaped soft masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

Bk2—36 to 51 inches; pale olive (5Y 6/3) silty clay loam, olive (5Y 5/3) moist; weak very coarse prismatic structure; very hard, very firm, very sticky and very plastic; few very fine roots; very few lignite channers; few fine irregularly shaped soft masses of lime; violent effervescence; moderately alkaline; clear wavy boundary.

C—51 to 80 inches; light yellowish brown (2.5Y 6/4) silty clay loam, olive brown (2.5Y 6/4) moist; massive; very hard, very firm, sticky and plastic; about 1 percent shale channers; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 12 to 30 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Texture: silty clay loam, silt loam, or clay loam
Notes: The range in rock fragments is 0 to 5 percent.

Bt horizon:
Hue: 10YR or 2.5Y
Value: 3 to 6, 2 to 4 moist
Chroma: 2 to 4
Texture: silty clay, silty clay loam, or clay
Notes: Rock fragments range from 0 to 5 percent.

Bk or C horizon:
Hue: 2.5Y or 5Y
Chroma: 2 to 4
Texture: silty clay loam, silty clay, or clay
Notes: Rock fragments range from 0 to 10 percent.

Scairt Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Landform: Pediments, hills, and ridges

Parent material: Residuum
Slope: 0 to 15 percent
Notes: These soils are saline-sodic.

Taxonomic class: Fine, smectitic, frigid Aridic Leptic Natrustolls

Typical pedon:
Scairt silt loam, 1,775 feet east and 150 feet north of the southwest corner of sec. 7, T. 143 N., R. 100 W. (Colors are for dry soil unless otherwise stated.)

E—0 to 2 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate thin platy structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots throughout; many very fine low continuity tubular pores; 25 percent clay; neutral; abrupt smooth boundary.

Btn—2 to 6 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; moderate medium columnar structure parting to moderate fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots throughout; many very fine low continuity tubular pores; 42 percent clay; grayish brown (2.5Y 5/2) dry coats on tops of columns and common faint discontinuous clay films on faces of peds; moderately alkaline; clear wavy boundary.

Btnz—6 to 13 inches; light olive brown (2.5Y 5/3) silty clay loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, firm, sticky and plastic; common very fine roots throughout; common very fine low continuity tubular pores; 38 percent clay; few faint patchy clay films on faces of peds; common fine threads of salt masses pedogenic throughout; few fine gypsum crystals pedogenic throughout; slight effervescence; moderately alkaline; clear wavy boundary.

Bkz—13 to 22 inches; light yellowish brown (2.5Y 6/3) silty clay loam, olive brown (2.5Y 4/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine low continuity tubular pores; 33 percent clay; common fine irregular salt masses pedogenic throughout; few fine gypsum crystals pedogenic throughout; common fine irregular masses of lime pedogenic throughout; strong effervescence; strongly alkaline; gradual wavy boundary.

BCy—22 to 28 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine low continuity tubular pores; 33 percent clay; common fine irregular nests of gypsum pedogenic throughout; very slight effervescence; strongly alkaline; abrupt wavy boundary.

Cr—28 to 60 inches; light gray (5Y 7/2) and light olive gray (5Y 6/2) weathered soft bedrock, olive gray (5Y 4/2) moist.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to gypsum or other salts: 7 to 16 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have an AE or Btkny horizon.

E horizon:
Hue: 2.5Y or 10YR
Value: 5 or 6, 3 or 4 moist

Chroma: 2 or 3
Texture: silt loam or loam

Btn horizon:
Hue: 2.5Y or 10YR
Value: 4 to 6, 3 to 5 moist
Texture: silty clay, silty clay loam, clay, or clay loam

Bk and BC horizons:
Hue: 2.5Y, 10YR, or 5Y
Value: 4 to 6, 4 or 5 moist
Chroma: 1 to 4
Texture: silty clay loam, silty clay, or silt loam

Cr horizon:
Hue: 5Y, 2.5Y, or 7.5YR
Value: 6 or 7, 4 or 5 moist
Chroma: 1 to 4

Schaller Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform: Escarpments
Parent material: Glaciofluvial deposits
Slope: 6 to 25 percent

Taxonomic class: Sandy, mixed, frigid Entic Haplustolls

Typical pedon:
Schaller sandy loam, 700 feet east and 90 feet south of the northwest corner of sec. 18, T. 131 N., R. 84 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 9 inches; dark brown (10YR 3/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; 5 percent gravel; neutral; clear wavy boundary.

Bk—9 to 15 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; few fine roots; 5 percent gravel; fine masses of lime; strong effervescence; slightly alkaline; abrupt wavy boundary.

C—15 to 60 inches; light yellowish brown (2.5Y 6/4) gravelly loamy coarse sand, light olive brown (2.5Y 5/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 20 percent gravel; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 10 to 16 inches
Depth to lime: 5 to 15 inches

A horizon:
Value: 2 or 3 moist
Texture: sandy loam or fine sandy loam

Bk horizon:
Notes: Some pedons do not have a Bk horizon.

C horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: sand, loamy coarse sand, loamy sand, or coarse sand
Notes: Rock fragments range from 2 to 35 percent.

Scorio Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow in the upper part and moderately rapid in the lower part
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Clayey over loamy, smectitic over mixed, superactive, calcareous, frigid Vertic Ustifluvents

Typical pedon:
Scorio silty clay, 695 feet north and 940 feet east of the southwest corner of sec. 18, T. 152 N., R. 103 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 8 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong coarse subangular blocky structure; very hard and very firm; very sticky and very plastic; many very fine and few fine and medium roots; strong effervescence; slightly alkaline; abrupt smooth boundary.

C1—8 to 32 inches; grayish brown (2.5Y 5/2) silty clay with few 1 to 3 inch strata of silt, dark grayish brown (2.5Y 4/2) moist; massive; very hard and very firm; very sticky and very plastic; common very fine roots; strong effervescence; slightly alkaline; gradual wavy boundary.

2C2—32 to 60 inches; stratified light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/3) moist and pale yellow (2.5Y 7/4) very fine sandy loam, light olive brown (2.5Y 5/4) moist; many fine prominent dark yellowish brown (10YR 4/6) moist redoximorphic concentrations; massive; slightly hard and friable; slightly sticky and slightly plastic; few very fine roots; strong effervescence; moderately alkaline.

Range in Characteristics

Salinity: The soil is saline in some map units.
Depth to loamy material: 20 to 40 inches

Ap horizon:
Value: 5 or 6, 3 or 4 moist

C horizon:
Value: 5 or 6, 3 or 4 moist
Chroma: 2 to 4
Texture: silty clay or silty clay loam
Notes: It is stratified in most pedons.

2C horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4

Texture: loamy very fine sand, fine sandy loam, or loam
Notes: It is stratified fine sand in some pedons.

Searing Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills, ridges, and pediments
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Fine-loamy over fragmental, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Searing loam, 1,960 feet east and 970 feet north of the southwest corner of sec. 20, T. 145 N., R. 94 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 8 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure parting to fine granular; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; neutral; abrupt smooth boundary.

Bw—8 to 23 inches; reddish brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) moist; strong coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; slightly alkaline; clear smooth boundary.

C1—23 to 33 inches; reddish yellow (5YR 6/6) channery loam, yellowish red (5YR 4/6) moist; massive; soft, friable, slightly sticky and slightly plastic; common fine roots; 15 percent porcelanite channers; slight effervescence; slightly alkaline; abrupt smooth boundary.

2C2—33 to 60 inches; reddish yellow (5YR 7/6) shattered porcelanite, yellowish red (5YR 5/6) moist; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 10 to 24 inches
Depth to shattered porcelanite: 20 to 40 inches
Notes: Some pedons have a Bk horizon.

Ap horizon:
Hue: 5YR, 7.5YR, or 10YR
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Texture: loam or silt loam

B horizon:
Hue: 5YR, 7.5YR, or 10YR
Value: 4 to 6, 3 or 4 moist
Chroma: 2 to 4
Texture: loam, silt loam, or clay loam

C horizon:
Texture: loam or clay loam
Notes: Rock fragments range from 5 to 30 percent.

2C horizon:
Notes: It is shattered porcelanite.

Sen Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Landform: Pediments, hills, knolls, and ridges
Parent material: Residuum
Slope: 0 to 25 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Sen silt loam, 180 feet west and 1,990 feet north of the southeast corner of sec. 36, T. 139 N., R. 99 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and nonplastic; common roots; neutral; abrupt smooth boundary.

Bw1—6 to 10 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate coarse and medium subangular blocky; slightly hard, friable, slightly sticky and nonplastic; common roots; neutral; clear wavy boundary.

Bw2—10 to 17 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; common roots; slightly alkaline; clear wavy boundary.

Bk1—17 to 23 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; common roots; medium generally rounded masses of carbonates; violent effervescence; slightly alkaline; clear wavy boundary.

Bk2—23 to 34 inches; white (2.5Y 8/2) silt loam, light yellowish brown (2.5Y 6/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common roots; many small iron concretions; strong effervescence; moderately alkaline; clear wavy boundary.

Cr—34 to 60 inches; pale yellow (5Y 7/3) and pale olive (5Y 6/3) soft stratified siltstone, pale olive (5Y 6/3) moist; slight effervescence.

Range in Characteristics

Depth to lime: 10 to 30 inches
Depth to soft bedrock: 20 to 40 inches

A horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3
Texture: loam or silt loam

Bw horizon:
Value: 3 to 6, 3 to 5 moist

Chroma: 2 to 4
Texture: silt loam, loam, or silty clay loam

Bk horizon:
Hue: 2.5Y or 5Y
Value: 5 to 8, 4 to 6 moist
Texture: silt loam, silty clay loam, or loam

Seroco Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform: Alluvial fans
Parent material: Eolian
Slope: 3 to 9 percent

Taxonomic class: Mixed, frigid Typic Ustipsamments

Typical pedon:
Seroco loamy fine sand, 1,056 feet south and 60 feet east of the northwest corner of sec. 13, T. 144 N., R. 86 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark brown (10YR 3/2) moist; weak medium subangular blocky structure; loose; many fine roots; slightly acid; gradual wavy boundary.

C1—3 to 20 inches; brown (10YR 5/3) fine sand, brown (10YR 4/3) moist; single grain; common fine roots; neutral; gradual wavy boundary.

C2—20 to 60 inches; brown (10YR 5/3) fine sand, brown (10YR 4/3) moist; single grain; few roots; neutral.

Range in Characteristics

Depth to lime: 30 to more than 60 inches
10 to 40 inch particle-size control section: loamy fine sand, loamy sand, or fine sand
Percent rock fragments: 0 to 10 percent
Notes: Some pedons have AC horizons.

A horizon:
Value: 4 to 6, 3 or 4 moist
Chroma: 2 or 3

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4

Sham Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Alluvial fans
Parent material: Alluvium

Slope: 1 to 15 percent
Notes: These soils are calcareous.

Taxonomic class: Coarse-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents

Typical pedon:
Sham loam, 2,210 feet south and 400 feet east of the northwest corner of sec. 8, T. 132 N., R. 105 W. (Colors are for dry soil unless otherwise stated.)

A1—0 to 4 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine granular and weak thin platy structure; hard, friable; many roots; moderately alkaline; clear wavy boundary.

A2—4 to 10 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; hard, friable; common roots; few pores; slight effervescence; moderately alkaline; clear wavy boundary.

C1—10 to 14 inches; light brownish gray (2.5Y 6/2) stratified fine sandy loam, grayish brown (2.5Y 5/2) moist; massive; very hard, friable; few roots; few pores; strong effervescence; strongly alkaline; clear wavy boundary.

C2—14 to 60 inches; light olive gray (5Y 6/2) stratified loam, silt loam, very fine sandy loam, and fine sandy loam, olive gray (5Y 5/2) moist; massive; very hard, friable; few fine roots in upper part; few masses of carbonates; strong effervescence; strongly alkaline.

Range in Characteristics

10 to 40 inch particle-size control section: Averages loam, silt loam or very fine sandy loam with 10 to 18 percent clay. It is stratified with 2 to 10 mm thick lenses.
Notes: In some pedons thin lenses of silty clay loam are at various depths. In some pedons coarser or finer textures are below depths of 40 inches.

A horizon:
Hue: 10YR or 2.5Y

Shambo Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Alluvial flats, alluvial fans, ridges, hills, knolls, and stream terraces
Parent material: Alluvium
Slope: 0 to 35 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Shambo loam, about 1,800 feet south and 1,150 feet east of the northwest corner of sec. 27, T. 131 N., R. 90 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; neutral; abrupt smooth boundary.

Bw1—9 to 13 inches; dark brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate

medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; neutral; clear wavy boundary.

Bw2—13 to 20 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; slightly alkaline; gradual wavy boundary.

Bw3—20 to 29 inches; light olive brown (2.5Y 5/4) loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; slightly alkaline; clear wavy boundary.

Bk—29 to 42 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; strong effervescence; moderately alkaline; gradual smooth boundary.

BCk—42 to 48 inches; light gray (2.5Y 7/2) loam, light brownish gray (2.5Y 6/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; strong effervescence; moderately alkaline; gradual smooth boundary.

C—48 to 60 inches; light gray (2.5Y 7/2) loam, light yellowish brown (2.5Y 6/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 10 to 35 inches
Notes: Some pedons have an Ab horizon. Some pedons have a loamy fine sand, gravelly loam, or gravelly loamy sand 2C horizon at a depth of more than 40 inches. Some pedons have a Cr horizon below a depth of 40 inches.

A horizon:
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3
Texture: loam or silt loam

Bw horizon:
Value: 4 to 6, 3 to 5 moist
Texture: loam, silt loam, or clay loam

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam, silt loam, silty clay loam, or clay loam
Notes: Some pedons do not have a BCk horizon.

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam, or is stratified with sandy loam, fine sandy loam, very fine sandy loam, silty clay loam, sandy clay loam, or clay loam

Stady Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over very rapid
Landform: Escarpments and stream terraces
Parent material: Alluvium
Slope: 0 to 9 percent

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Stady loam, 220 feet north and 115 feet east of the southwest corner of sec. 35, T. 133 N., R. 100 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; friable; many roots and very fine pores; neutral; abrupt smooth boundary.

Bw1—6 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; strong coarse prismatic and moderate medium subangular blocky structure; friable; common roots; common very fine pores; faint clay films on prism faces; neutral; gradual smooth boundary.

Bw2—12 to 15 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; moderate coarse prismatic structure; friable; few roots; common very fine pores; neutral; clear wavy boundary.

Bk1—15 to 18 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic and moderate coarse and medium subangular blocky structure; friable; few roots; strong effervescence; slightly alkaline; clear wavy boundary.

Bk2—18 to 29 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic and weak coarse subangular blocky structure; friable; few roots; few stones; common masses of lime; violent effervescence; moderately alkaline; clear wavy boundary.

2Bk3—29 to 42 inches; light brownish gray (2.5Y 6/2) sand and gravel, grayish brown (2.5Y 5/2) moist; single grain; loose; thin lime crusts coat bottom of all pebbles; violent effervescence; moderately alkaline; gradual boundary.

2C—42 to 60 inches; light yellowish brown (10YR 6/4) sand and gravel, dark yellowish brown (10YR 4/4) moist; single grain; loose; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 15 to 25 inches
Depth to sand and gravel: 20 to 40 inches

Ap horizon:
Value: 3 to 5, 2 or 3 moist

Bw horizon:
Value: 4 to 6, 2 to 4 moist
Chroma: 2 to 4

Bk horizon:
Hue: 10YR or 2.5Y

Value: 6 or 7, 4 or 5 moist
Chroma: 2 to 4

2Bk and 2C horizons:
Value: 4 or 5

Straw Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Flood plains and alluvial flats
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Cumulic Haplustolls

Typical pedon:
Straw loam, 1,800 feet west and 30 feet south of the northeast corner of sec. 10, T. 136 N., R. 94 E. (Colors are for dry soil unless otherwise stated.) (fig. 24)

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; weak medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; neutral; clear wavy boundary.

A1—5 to 10 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; neutral; clear wavy boundary.

A2—10 to 23 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine roots; mildly alkaline; clear wavy boundary.

A3—23 to 30 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots; disseminated lime throughout; slight effervescence; moderately alkaline; gradual wavy boundary.

C—30 to 36 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; massive; very hard, firm, sticky and plastic; common very fine roots; few pebbles; few fine and medium rounded soft masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

Ab—36 to 40 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; common fine and medium irregularly shaped soft masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

C'—40 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; massive; very hard, firm, sticky and plastic; few very fine roots; few fine and medium irregularly shaped soft masses of lime; strong effervescence; moderately alkaline.

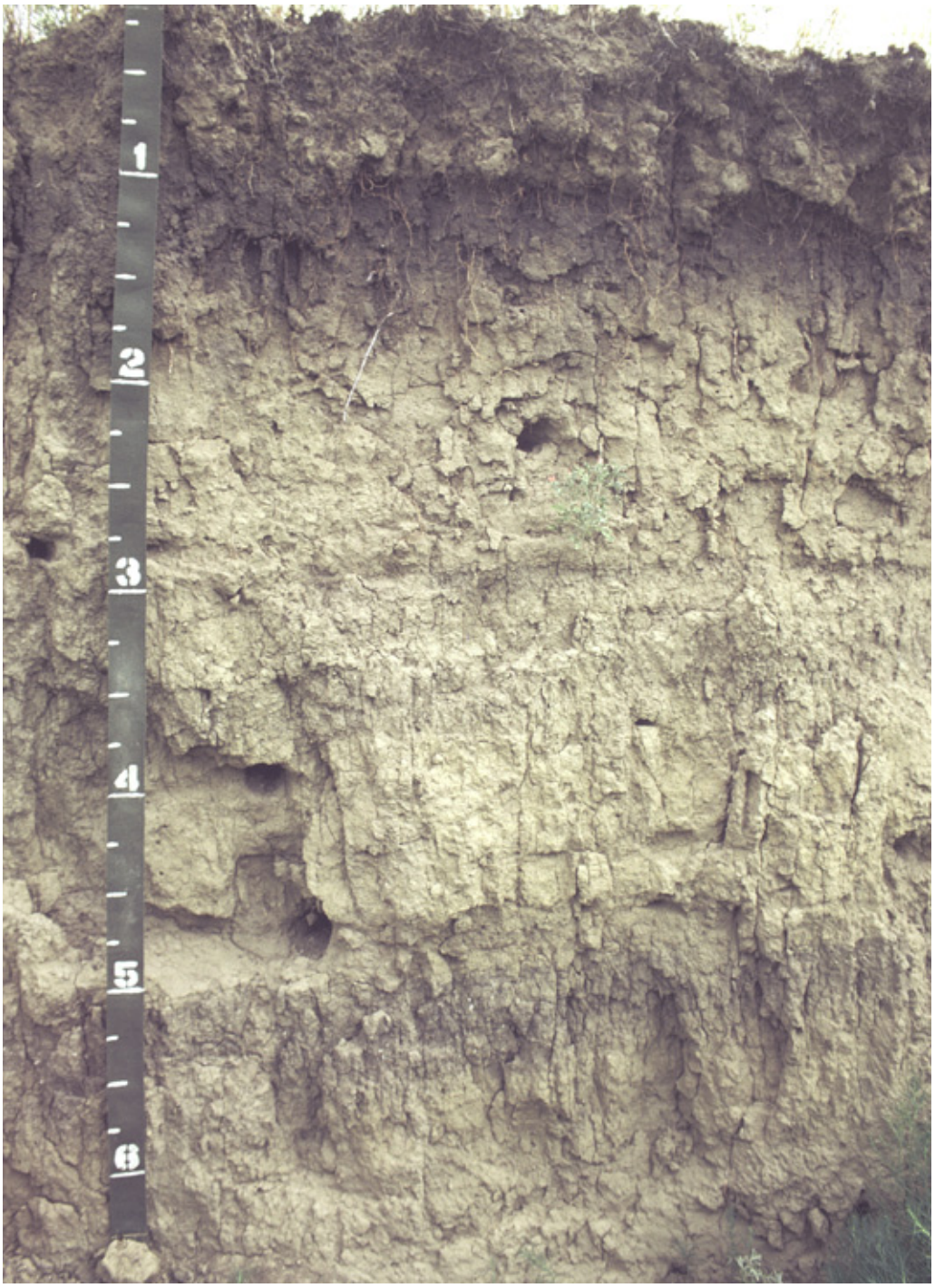


Figure 24. Typical profile of Straw loam.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches
Depth to the Bk horizon: 13 to 30 inches
Notes: The soil may be noncalcareous to a depth of 25 inches. Some pedons have Bw or Ab horizons. This soil has a range of 0 to 10 percent gravel.

Ap and A horizons:
Hue: 10YR or 2.5Y
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3
Texture: loam, clay loam, silt loam, sandy clay loam, or silty clay loam
Notes: This horizon has less than 15 to 35 percent fine and coarser sand.

Bk horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: loam, silt loam, silty clay loam, or clay loam
Notes: This horizon has less than 15 to 35 percent fine and coarser sand.

C horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4
Texture: loam, silt loam, or clay loam stratified with sandy loam, or fine sandy loam

2C horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: stratified loam to loamy sand but, mainly sandy loam or loamy sand

Tally Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Alluvial fans, alluvial flats, ridges, stream terraces, escarpments, and hills
Parent material: Alluvium
Slope: 0 to 15 percent

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Tally fine sandy loam, 1,200 feet east and 2,000 feet south of the northwest corner of sec. 7, T. 20 N., R. 56 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; dark brown (10YR 3/3) fine sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; neutral; abrupt smooth boundary.

Bw1—6 to 14 inches; dark brown (10YR 3/3) fine sandy loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; many fine and very fine pores; neutral; clear smooth boundary.

Bw2—14 to 32 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common fine and very fine roots; many fine and very fine pores; neutral; clear smooth boundary.

Bk1—32 to 38 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine roots; common very fine pores; strong effervescence; moderately alkaline; clear smooth boundary.

Bk2—38 to 60 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; common very fine pores; violent effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Percent rock fragments: up to 15 percent above 40 inches and up to 25 percent below 40 inches
Depth to the Bk horizon: 15 to 35 inches
Depth to loamy fine sand and coarser material: more than 20 inches
Notes: Some pedons have a C horizon.

Ap horizon:
Hue: 7.5YR, 10YR, or 2.5Y
Value: 3 to 5, 2 to 4 moist
Texture: fine sandy loam or sandy loam

Bw horizon:
Hue: 7.5YR, 10YR, or 2.5Y
Texture: fine sandy loam or sandy loam

Bk horizon:
Hue: 7.5YR, 10YR, or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: fine sandy loam or sandy loam
Notes: It has textures of loamy fine sand, loamy sand, or fine sand below a depth of 40 inches in some pedons.

Tanna Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Landform: Pediments and ridges
Parent material: Residuum
Slope: 0 to 35 percent

Taxonomic class: Fine, smectitic, frigid Aridic Argiustolls

Typical pedon:
Tanna clay loam, 400 feet north and 150 feet east of the southwest corner of sec. 34, T. 22 N., R. 3 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; hard, very friable, sticky and plastic; many fine and very fine roots; neutral; abrupt wavy boundary.

Bt—6 to 17 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to strong fine and medium blocky; very hard, friable, sticky and plastic; many fine and very fine roots; many fine and very fine pores; many distinct clay films on faces of peds; 5 percent channers; slightly alkaline; clear wavy boundary.

Bk1—17 to 27 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure; very hard, friable, sticky and plastic; common fine and very fine roots; many fine and very fine pores; 5 percent channers; continuous distinct lime coating on channers; common fine masses of segregated lime; strong effervescence; moderately alkaline; gradual wavy boundary.

Bk2—27 to 31 inches; pale brown (10YR 6/3) very channery loam, brown (10YR 4/3) moist; massive; hard, very friable, slightly sticky and nonplastic; common fine and very fine roots; many fine and very fine pores; 55 percent channers; continuous distinct lime coating on channers; few fine masses of lime; strong effervescence; moderately alkaline; gradual wavy boundary.

Cr—31 to 60 inches; semiconsolidated shale and mudstone interbedded with layers of hard sandstone.

Range in Characteristics

Mollic epipedon thickness: 7 to 12 inches
Depth to the Bk horizon: 10 to 20 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have a Bky horizon.

Ap horizon:
Hue: 10YR or 2.5Y
Value: 2 or 3 moist
Chroma: 2 or 3
Notes: Rock fragments range from 0 to 25 percent.

Bt horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 2 or 3
Texture: clay loam, silty clay loam, clay, or silty clay
Notes: Rock fragments range from 0 to 10 percent.

Bk horizons:
Value: 5 to 7, 4 to 6 moist
Chroma: 1 to 4
Texture: clay loam, silty clay loam, clay, or loam
Notes: Rock fragments range from 0 to 10 percent in the upper part and 0 to 60 percent in the lower part.

Tansem Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Glacial lake plains
Parent material: Glaciolacustrine sediments
Slope: 0 to 6 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Tansem silt loam, 1,650 feet north and 500 feet west of the southeast corner of sec. 5, T. 142 N., R. 75 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak medium and fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; slightly alkaline; abrupt smooth boundary.

Bw1—6 to 10 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate coarse and medium prismatic structure parting to strong medium subangular blocky; hard, friable, slightly sticky and slightly plastic; thin very dark brown (10YR 2/2) coats of organic staining on prism faces; slightly alkaline; gradual smooth boundary.

Bw2—10 to 14 inches; light olive brown (2.5Y 5/4) silt loam, olive brown (2.5Y 4/3) moist; moderate coarse and medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; slightly alkaline; clear wavy boundary.

Bk1—14 to 17 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; weak coarse prismatic structure parting to moderate medium prismatic and weak coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; strong effervescence; few large white carbonate spots; slightly alkaline; clear wavy boundary.

Bk2—17 to 23 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; weak coarse prismatic structure; hard, friable, slightly sticky and slightly plastic; violent effervescence; many large prominent white carbonate accumulations; slightly alkaline; gradual smooth boundary.

Bk3—23 to 28 inches; light yellowish brown (2.5Y 6/4) silt loam, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure; hard, friable, slightly sticky and slightly plastic; strong effervescence; few large and common very small white carbonate accumulations; slightly alkaline; clear wavy boundary.

C—28 to 60 inches; pale yellow (2.5Y 7/3) varved silt loam, light olive brown (2.5Y 5/3) moist; massive; many dark yellowish brown (10YR 4/4) stains on surface of varved material; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 14 to 20 inches
Depth of mollic epipedon: 7 to 16 inches

A horizon:
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3

Bw horizon:
Value: 4 to 6
Texture: loam or silt loam

Bk horizon:
Value: 6 to 8, 4 to 6 moist
Chroma: 2 to 4

C horizon:
Value: 5 to 7, 4 to 6 moist

Chroma: 2 to 4
Notes: It is varved loam, silt, silt loam, very fine sandy loam, or fine sandy loams in distinct layers. Finer or coarser textures are at depth below 40 inches in some pedons.

Telfer Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Hills, ridges, alluvial flats, and alluvial fans
Parent material: Alluvium
Slope: 0 to 25 percent

Taxonomic class: Sandy, mixed, frigid Entic Haplustolls

Typical pedon:
Telfer fine sandy loam, 265 feet north and 150 feet west of the center of sec. 32, T. 138 N., R. 79 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; single grain; loose; many roots; neutral; clear smooth boundary.

AC—6 to 14 inches; grayish brown (10YR 5/2) fine sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; common roots; neutral; gradual boundary.

C—14 to 60 inches; light olive brown (2.5Y 5/4) fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; few roots at top and few fine roots at 40 inches; neutral.

Range in Characteristics

Mollic epipedon thickness: 10 to 20 inches

A horizon:
Value: 3 to 5, 2 or 3 moist
Texture: fine sandy loam or sandy loam

AC horizon:
Value: 4 or 5
Texture: loamy sand, fine sand, or loamy fine sand

C horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 4 or 5 moist
Texture: fine sand or sand

Temvik Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over moderately slow
Landform: Plains
Parent material: Eolian
Slope: 0 to 6 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Temvik silt loam, 2,605 feet north and 280 feet east of the southwest corner of sec. 20, T. 135 N., R. 76 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky and weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many roots; many very fine pores; neutral; abrupt smooth boundary.

Bw1—7 to 11 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate medium prismatic and weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many roots; many pores; faint clay films on vertical faces and common faint clay films on horizontal faces of peds; few thin tongues of Ap extend into this horizon; neutral; gradual wavy boundary.

Bw2—11 to 20 inches; brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; moderate coarse and medium prismatic structure parting to moderate coarse and medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common roots; common fine pores; faint clay films on faces of peds; neutral; clear wavy boundary.

Bw3—20 to 24 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; few roots; common fine pores; few pebbles and stones at the base of this horizon; neutral; clear wavy boundary.

2Bk1—24 to 36 inches; light brownish gray (2.5Y 6/2) clay loam, olive brown (2.5Y 4/4) moist; common fine distinct yellowish brown (10YR 5/4) redoximorphic concentrations; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; hard, friable, sticky and plastic; about 3 percent gravel; many medium and few large masses of carbonates; strong effervescence; moderately alkaline; gradual wavy boundary.

2Bk2—36 to 44 inches; light olive gray (5Y 6/2) clay loam, olive brown (2.5Y 4/4) moist; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; weak coarse and fine subangular blocky structure; hard, friable, sticky and plastic; about 3 percent gravel; common masses of carbonates; strong effervescence; moderately alkaline; gradual boundary.

2C—44 to 60 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 5/2) moist; weak subangular blocky structure; hard, firm, sticky and plastic; about 3 percent gravel; few small masses of carbonates; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches in thickness.
Depth to glacial till: 20 to 40 inches
Notes: The silty loess material contains between 18 and about 28 percent clay. Some pedons have a 2Bw horizon that formed in the underlying glacial till.

A horizon:
Value: 4 or 5, 2 or 3 moist
Chroma: 2 or 3
Texture: silt loam and less commonly silty clay loam, loam, or clay loam
Notes: This horizon contains between 10 and 30 percent very fine sand.

Bw horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 or 4 moist
Chroma: 2 to 4
Texture: silt loam and less commonly silty clay loam, loam, or clay loam
Notes: This horizon contains between 10 and 30 percent very fine sand.

2Bk horizon:
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: clay loam or loam
Notes: Some pedons have 2BCk horizons. Some pedons have a Bk horizon that formed in the silty loess material.

2C horizon:
Hue: 2.5Y or 5Y
Value: 4 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam or clay loam
Notes: This horizon is glacial till containing 2 to 8 percent coarse fragments. Soft bedded sandstone, siltstone, or shale is below depths of 40 inches in some pedons.

Tinsley Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform: Paleoterraces and escarpments
Parent material: Alluvium
Slope: 3 to 35 percent

Taxonomic class: Sandy-skeletal, mixed, frigid Aridic Ustorthents

Typical pedon:
Tinsley very gravelly sandy loam, 2,500 feet south and 2,000 feet east of the northwest corner of sec. 26, T. 12 N., R. 51 E. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; brown (10YR 4/3) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine roots; 10 percent cobbles, 45 percent gravel; neutral; clear boundary.

C1—3 to 11 inches; brown (10YR 5/3) extremely gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grain; soft, very friable, nonsticky and nonplastic; many very fine roots; 10 percent cobbles, 55 percent gravel; neutral; clear smooth boundary.

C—11 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common very fine roots in the upper 13 inches and few very fine roots below that depth; 10 percent cobbles, 50 percent gravel; very slight effervescence; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4
Texture: sandy loam or loamy sand
Notes: Rock fragments range from 15 to 60 percent.

C horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: sand or loamy sand
Notes: Rock fragments range from 35 to 80 percent.

Tonka Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Depressions
Parent material: Alluvium
Slope: 0 to 1 percent

Taxonomic class: Fine, smectitic, frigid Argiaquic Argialbolls

Typical pedon:
Tonka silt loam, 2,500 feet west and 590 feet south of the northeast corner of sec. 2, T. 136 N., R. 56 W. (Colors are for moist soil unless otherwise stated.)

A—0 to 13 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure parting to moderate thin platy; soft, friable, slightly sticky and slightly plastic; many fine roots; many fine pores; slightly acid; abrupt wavy boundary.

E—13 to 19 inches; dark gray (10YR 4/1) loam, light gray (10YR 7/1) dry; many medium prominent dark brown (10YR 3/3) and dark yellowish brown (10YR 3/4) redoximorphic concentrations; moderate thin platy and moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; moderately acid; abrupt irregular boundary.

Bt1—19 to 24 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (10YR 5/2) dry; common fine faint brown (10YR 4/3) redoximorphic concentrations; strong coarse prismatic structure parting to moderate very fine angular blocky; very hard, firm, sticky and slightly plastic; common fine roots; bleached sand grains coat tops of prisms and vertical faces of peds; moderately acid; gradual wavy boundary.

Bt2—24 to 34 inches; dark grayish brown (10YR 4/2) silty clay loam, light brownish gray (10YR 6/2) dry; moderate coarse prismatic structure parting to moderate very fine angular blocky; very hard, firm, sticky and slightly plastic; common fine roots; bleached sand grains coat faces of peds; moderately acid; gradual wavy boundary.

2BC—34 to 50 inches; dark grayish brown (2.5Y 4/2) clay loam, light brownish gray (2.5Y 6/2) dry; common medium distinct dark yellowish brown (10YR 3/4) redoximorphic concentrations; weak coarse prismatic structure parting to moderate fine subangular blocky; very hard, firm, sticky and slightly plastic; few fine roots; common fine very dark brown (10YR 2/2) manganese concretions; about 2 percent gravel; neutral; gradual boundary.

2Cg—50 to 60 inches; gray (5Y 5/1) clay loam, light gray (5Y 6/1) dry; many medium distinct dark brown (7.5YR 4/4) redoximorphic concentrations; weak fine platy and moderate very fine angular blocky structure; hard, friable, sticky and slightly plastic; few fine roots; common fine very dark brown (10YR 2/2) manganese concretions; about 3 percent gravel; strong effervescence; slightly alkaline.

Range in Characteristics

Depth to lime: 20 to more than 60 inches
Depth to the Bt horizon: 12 to 28 inches
Notes: Some pedons have a Bk horizon.

A horizon:
Hue: 10YR or neutral
Value: 2 or 3, 3 to 5 dry
Chroma: 0 or 1
Texture: silt loam, loam, clay loam, or silty clay loam

E horizon:
Hue: 10YR, 2.5Y, or neutral
Value: 3 to 5, 5 to 7 dry
Chroma: 0 to 2
Texture: loam, silt loam, very fine sandy loam, or silty clay loam

Bt horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 2 to 4
Texture: clay loam, silty clay loam, silty clay, or clay

2Cg horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 2 to 6, 3 to 7 dry
Chroma: 1 to 6
Texture: silty clay loam, clay loam, or loam

Trembles Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately rapid
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Coarse-loamy, mixed, superactive, calcareous, frigid Typic Ustifluvents

Typical pedon:
Trembles fine sandy loam, 1,480 feet south and 1,320 feet east of the northwest corner of sec. 8, T. 23 N., R. 60 E. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 9 inches; grayish brown (2.5Y 5/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse subangular blocky structure parting to moderate coarse granular; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; very slight effervescence; slightly alkaline; abrupt smooth boundary.

C1—9 to 15 inches; light yellowish brown (2.5Y 6/3) stratified fine sandy loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; stratification are 1 to 2 mm thick; few very fine roots throughout; common fine irregular dark yellowish brown (10YR 4/6) iron concretions pedogenic throughout; slight effervescence; slightly alkaline; clear smooth boundary.

C2—15 to 23 inches; light brownish gray (2.5Y 6/2) stratified silt loam, very fine sandy loam, and loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; stratification are 1 to 2 mm thick; few very fine roots throughout; common medium irregular strong brown (7.5YR 4/6) iron concretions pedogenic throughout; few fine irregular masses of lime pedogenic throughout; strong effervescence; moderately alkaline; clear smooth boundary.

C3—23 to 27 inches; light yellowish brown (2.5Y 6/3) fine sandy loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; stratification are 1 to 2 mm thick; few very fine roots throughout; many fine irregular dark yellowish brown (10YR 4/6) iron concretions pedogenic throughout; strata of organic matter or coal 1 mm thick throughout; strong effervescence; moderately alkaline; clear smooth boundary.

C4—27 to 48 inches; light brownish gray (2.5Y 6/2) fine sandy loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; stratification are 1 to 2 mm thick; few very fine roots throughout; strata of organic matter or coal 1 mm thick throughout; slight effervescence; moderately alkaline; clear smooth boundary.

C5—48 to 59 inches; light brownish gray (2.5Y 6/2) stratified very fine sandy loam, silt loam, and fine sandy loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; stratification are 1 to 2 mm thick; strong effervescence; moderately alkaline; clear smooth boundary.

2C6—59 to 63 inches; light brownish gray (2.5Y 6/2) stratified sand, grayish brown (2.5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; stratification are 1 to 2 mm thick; common fine irregular dark yellowish brown (10YR 4/6) iron concretions pedogenic throughout; slight effervescence; strata of organic matter or coal 1 mm thick throughout; moderately alkaline; clear smooth boundary.

2C7—63 to 80 inches; light brownish gray (2.5Y 6/2) sand, grayish brown (2.5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; common fine irregular dark yellowish brown (10YR 4/6) iron concretions pedogenic throughout; strata of coal 1 mm thick throughout; slight effervescence; moderately alkaline.

Range in Characteristics

Ap horizon:

Hue: 10YR or 2.5Y

C horizon:

Hue: 2.5Y or 10YR

Texture: fine sandy loam, very fine sandy loam, sandy loam, loam, or silt loam

Tusler Series

Depth class: Moderately deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Ridges
Parent material: Residuum
Slope: 3 to 35 percent

Taxonomic class: Mixed, frigid Aridic Ustipsamments

Typical pedon:
Tusler loamy fine sand, 1,820 feet east and 1,630 feet south of the northwest corner of sec. 30, T. 129 N., R. 106 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; grayish brown (10YR 5/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; loose; many roots; neutral; abrupt smooth boundary.

C1—3 to 10 inches; grayish brown (10YR 5/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; loose; many roots; slight effervescence; slightly alkaline; clear wavy boundary.

C2—10 to 19 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak medium subangular blocky structure; loose; few roots; slight effervescence; slightly alkaline; gradual wavy boundary.

C3—19 to 27 inches; light yellowish brown (2.5Y 6/4) loamy fine sand, light olive brown (2.5Y 5/4) moist; weak medium subangular blocky structure parting to single grain; loose; few roots; strong effervescence; moderately alkaline; clear wavy boundary.

Cr—27 to 60 inches; light gray (2.5Y 7/2) soft sandstone that crushes to loamy fine sand, grayish brown (2.5Y 5/2) moist; hard and brittle when dry; strong effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 0 to 12 inches
Depth to soft bedrock: 20 to 40 inches
10 to 40 inch particle-size control section: loamy fine sand, fine sand, or loamy sand

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6, 3 or 4 moist
Chroma: 2 or 3

C horizon:
Texture: loamy fine sand, fine sandy loam, or sandy loam

Cr horizon:
Hue: 2.5Y or 5Y
Value: 6 or 7, 5 or 6 moist
Chroma: 2 or 3
Notes: It is calcareous, weakly consolidated soft sandstone that crushes to loamy fine sand or fine sand. It is massive or platy, and hard and brittle when dry. Some pedons have soft layers and a few have layers of very hard sandstone.

Vebar Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Pediments, divides, knolls, hills, and ridges
Parent material: Residuum
Slope: 0 to 50 percent

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Vebar fine sandy loam, 2,570 feet west and 355 feet south of the northeast corner of sec. 16, T. 138 N., R. 95 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak coarse and medium prismatic structure parting to weak fine subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many roots; many fine pores; slightly acid; gradual wavy boundary.

Bw1—5 to 14 inches; dark grayish brown (10YR 4/2) fine sandy loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many fine roots; many fine pores; slightly acid; gradual wavy boundary.

Bw2—14 to 19 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; moderate coarse prismatic structure parting to weak medium and fine subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; common fine roots; common fine pores; neutral; clear wavy boundary.

Bw3—19 to 26 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; few roots; common fine pores; neutral; clear wavy boundary.

BCk—26 to 32 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few hard sandstone fragments; few small sandstone fragments; few small lime accumulations; strong effervescence; slightly alkaline; clear wavy boundary.

Cr—32 to 60 inches; light yellowish brown (2.5Y 6/4) dry soft sandstone; strong effervescence in upper part and slight effervescence in lower part; lenses of hard sandstone 3 inches thick at 43 inches with lime accumulations around hard fragments; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to soft bedrock: 20 to 40 inches
Notes: Some pedons have an A horizon that is extremely stony fine sandy loam or extremely stony sandy loam.

A horizon:
Value: 3 to 5, 2 or 3 moist
Texture: fine sandy loam or sandy loam

Bw horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 2 to 4

C horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: fine sandy loam or loamy fine sand

Velva Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Fluventic Haplustolls

Typical pedon:
Velva fine sandy loam, 1,090 feet west and 90 feet north of the southeast corner of sec. 13, T. 144 N., R. 87 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many roots; many fine pores; neutral; abrupt smooth boundary.

AC—6 to 12 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak very coarse prismatic structure parting to weak coarse subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many roots; many fine pores; slightly alkaline; abrupt smooth boundary.

Ab—12 to 13 inches; very dark grayish brown (10YR 3/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many roots; many fine pores; slight effervescence; slightly alkaline; clear smooth boundary.

C1—13 to 15 inches; grayish brown (2.5Y 5/2) fine sandy loam, very dark grayish brown (2.5Y 3/2) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common roots; common fine pores; strong effervescence; slightly alkaline; clear smooth boundary.

C2—15 to 36 inches; grayish brown (2.5Y 5/2) fine sandy loam with thin strata of loam and loamy fine sand less than 1 inch thick, dark grayish brown (2.5Y 4/2) moist; weak very coarse prismatic structure parting to weak coarse and medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common roots; common fine pores; strong effervescence; slightly alkaline; clear smooth boundary.

C3—36 to 52 inches; grayish brown (2.5Y 5/2) loamy fine sand, very dark grayish brown (2.5Y 3/2) moist; single grain; few roots; strong effervescence; moderately alkaline; clear smooth boundary.

C4—52 to 60 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few roots; few pores; strong effervescence; moderately alkaline.

Range in Characteristics

10 to 40 inch particle-size control section: averages 7 to 18 percent clay and 25 and 60 percent fine sand and coarser sand
Notes: Some pedons have Bw or Bk horizons.

Ap horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, 2 or 3 moist
Chroma: 1 to 3

C horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 to 5 moist
Chroma: 2 to 4
Texture: averages fine sandy loam, very fine sandy loam, or loam

Wabek Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Very rapid
Landform: Escarpments and stream terraces
Parent material: Alluvium
Slope: 3 to 25 percent

Taxonomic class: Sandy-skeletal, mixed, frigid Entic Haplustolls

Typical pedon:
Wabek loam, 2,490 feet north of the southeast corner of sec. 1, T. 140 N., R. 77 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many roots; about 3 percent rock fragments; neutral; gradual wavy boundary.

Bk—5 to 9 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, brown (10YR 4/3) moist; single grain; common roots; about 25 percent rock fragments; lime crusts coat undersides of rock fragments; strong effervescence; slightly alkaline; diffuse boundary.

C—9 to 60 inches; pale brown (10YR 6/3) very gravelly coarse sand, grayish brown (10YR 5/2) moist; stratified with varying amounts and mixtures of gravel and cobblestones; single grain; few roots in upper 10 inches; about 50 percent rock fragments; strong effervescence decreasing to slight effervescence in the lower part; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 11 inches
Depth to sand and gravel: 7 to 14 inches

Ap horizon:
Value: 3 or 4, 2 or 3 moist
Notes: Rock fragments range up to 45 percent.

Bk horizon:
Hue: 10YR or 2.5Y
Value: 4 to 8, 2 to 6 moist

Chroma: 2 to 4
Notes: Rock fragments range from 5 to 60 percent.

C horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 to 6 moist
Chroma: 2 to 4
Notes: Rock fragments range from 20 to 70 percent.

Wanagan Series

Depth class: Very deep
Drainage class: well
Permeability: Moderate
Landform: Terraces
Parent material: Alluvium
Slope: 0 to 6 percent

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Typic Haplustolls

Typical pedon:
Wanagan loam, 1,250 feet south and 1,700 feet east of the northwest corner of sec. 17, T. 141 N., R. 105 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak thin platy structure; slightly hard, very friable, sticky and plastic; few very fine roots; slightly acid; abrupt smooth boundary.

Bw—7 to 14 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; 2 percent gravel; slightly alkaline; clear wavy boundary.

Bk—14 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; 5 percent gravel; violent effervescence; slightly alkaline; clear wavy boundary.

2BCk—18 to 26 inches; very pale brown (10YR 7/3) and brown (10YR 5/3) very gravelly sandy clay loam, pale brown (10YR 6/3) and dark brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; 40 percent gravel; 5 percent cobbles; common fine masses of carbonates; violent effervescence; moderately alkaline; gradual wavy boundary.

2C1—26 to 39 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; 60 percent gravel; 5 percent cobbles; violent effervescence; moderately alkaline; gradual wavy boundary.

2C2—39 to 50 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; 50 percent gravel; 5 percent cobbles; strong effervescence; moderately alkaline; clear wavy boundary.

2C3—50 to 60 inches; light brownish gray (2.5Y 6/2) extremely gravelly loam, grayish brown (2.5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; 60 percent gravel; 5 percent cobbles; violent effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 8 to 16 inches
Depth to lime: 8 to 16 inches
Notes: The thickness of the solum ranges from 14 to 30 inches. The depth to horizons containing 35 percent or more gravel ranges from 14 to 28 inches.

Ap horizon:
Value: 4 or 5, 2 or 3 moist

Bw horizon:
Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3
Notes: The percent gravel ranges from 1 to 15.

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 8, 4 to 7 moist
Chroma: 2 to 4
Notes: The percent rock fragments ranges from 5 to 15.

2BCk horizon:
Texture: loam or sandy clay loam
Notes: The percent rock fragments ranges from 15 to 60.

2C horizon:
Hue: 2.5Y, 5Y or 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: loam, fine sandy loam, or clay loam
Notes: The percent rock fragments ranges from 35 to 85.

Wayden Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Slow
Landform: Ridges, hills, pediments, and divides
Parent material: Residuum
Slope: 3 to 25 percent
Notes: These soils are calcareous.

Taxonomic class: Clayey, smectitic, calcareous, frigid, shallow Typic Ustorthents

Typical pedon:
Wayden silty clay, 475 feet north and 130 feet west of the southeast corner of sec. 13, T. 131 N., R. 102 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; light gray (2.5Y 7/2) silty clay, grayish brown (2.5Y 5/2) moist; strong very fine granular structure; hard, friable, sticky and plastic; many fine and very fine roots; slight effervescence; moderately alkaline; clear wavy boundary.

Bk—3 to 7 inches; light gray (5Y 7/2) silty clay, olive gray (5Y 5/2) moist; moderate coarse and medium subangular blocky structure parting to moderate fine subangular blocky; very hard, friable, sticky and plastic; common fine and very fine roots; common fine pores; strong effervescence; moderately alkaline; gradual smooth boundary.

By—7 to 15 inches; light gray (5Y 7/2) silty clay, olive gray (5Y 5/2) moist; weak coarse subangular blocky structure parting to moderate fine subangular blocky; very hard, friable, sticky and plastic; common fine and very fine roots; many gypsum crystals; few soft shale chips; slight effervescence; moderately alkaline; gradual wavy boundary.

Cr—15 to 60 inches; olive (5Y 5/3) stratified silty clay shale, pale olive (5Y 6/3) moist; yellowish brown (10YR 5/6) moist stains on plates in places; extremely hard, very fine; slakes in water; slight effervescence; moderately alkaline.

Range in Characteristics

Depth to soft bedrock: 10 to 20 inches
Notes: Some pedons have an AC or ABk horizon. Some pedons have C horizons above the Cr.

A horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 3 to 5 moist
Chroma: 2 or 3
Texture: silty clay or clay
Notes: Some uncultivated pedons have a chroma of 1.

Bk and By horizons:
Hue: 2.5Y or 5Y
Value: 5 to 8, 4 to 6 moist
Chroma: 1 to 4
Texture: silty clay, silty clay loam, clay, or clay loam
Notes: Some pedons do not have Bk or By horizons.

Williams Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Till plains and moraines
Parent material: Glacial till
Slope: 0 to 35 percent

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical pedon:
Williams loam, 1,050 feet east and 60 feet south of the northwest corner of sec. 5, T. 158 N., R. 94 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; few pebbles; neutral; abrupt smooth boundary.

Bt1—6 to 10 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; strong medium prismatic structure parting to strong medium angular blocky; hard, firm, sticky and plastic; common very fine roots; many distinct clay films on faces of peds and lining pores; few pebbles; neutral; clear wavy boundary.

Bt2—10 to 15 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to strong medium subangular blocky; hard, firm, sticky and plastic; common very fine

roots; many distinct clay films on faces of peds and lining pores; slightly alkaline; clear wavy boundary.

Btk—15 to 24 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky and plastic; common very fine roots; few faint clay films on faces of peds; few pebbles; common medium irregular masses of lime; violent effervescence; slightly alkaline; gradual wavy boundary.

Bk—24 to 36 inches; light brownish gray (2.5Y 6/2) and light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; soft, friable, sticky and plastic; few very fine roots; few cobbles; lime disseminated throughout and in common masses; violent effervescence; moderately alkaline; gradual wavy boundary.

C—36 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; few fine prominent yellowish brown (10YR 5/6) dry redoximorphic concentrations and light gray (10YR 7/2) dry redoximorphic depletions; massive; soft, friable, sticky and plastic; few pebbles and cobbles; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches
Depth to lime: 11 to 18 inches
Notes: Some pedons have a BCk horizon.

Ap horizon:
Value: 3 or 4, 2 or 3 moist
Texture: loam or silt loam

Bt horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4

Btk horizon:
Notes: Some pedons do not have a Btk horizon.

Bk horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, 3 to 5 moist
Chroma: 2 to 4
Texture: loam or clay loam

C horizon:
Hue: 2.5Y or 5Y
Value: 6 or 7, 4 to 6 moist
Chroma: 2 to 4
Texture: loam or clay loam

Wilton Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over moderately slow
Landform: Terraces
Parent material: Loess over glacial till
Slope: 0 to 6 percent

Taxonomic class: Fine-silty, mixed, superactive, frigid Pachic Haplustolls

Typical pedon:
Wilton silt loam, 1,600 feet east and 300 feet north of southwest corner of sec. 31, T. 147 N., R. 83 W. (Colors are for dry soil unless otherwise stated.)

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable; slightly sticky and slightly plastic; common roots, neutral; abrupt smooth boundary.

Bw1—8 to 13 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; common fine pores; neutral; clear wavy boundary.

Bw2—13 to 18 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common fine pores; faint clay films on some vertical faces of peds; very dark brown (10YR 2/2) coatings on peds; neutral; gradual wavy boundary.

Bw3—18 to 27 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common fine pores; slight effervescence in spots; slightly alkaline; clear wavy boundary.

2Bk1—27 to 36 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; hard, friable, sticky and plastic; few fine roots; common fine pores; about 5 percent rock fragments; strong effervescence; many medium and few large masses of lime; slightly alkaline; gradual wavy boundary.

2Bk2—36 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, olive brown (2.5Y 4/3) moist; few fine prominent strong brown (7.5YR 5/6) dry redoximorphic concentrations; massive; hard, friable, sticky and plastic; few roots; about 5 percent rock fragments; strong effervescence; common masses of lime; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 inches to more than 30 inches
Depth to glacial till: 20 to 40 inches
Notes: Some pedons have a 2C horizon.

Ap horizon:
Value: 3 to 5, 2 or 3 moist

Bw horizon:
Hue: 10YR or 2.5Y
Value: 2 to 4 moist
Chroma: 2 to 4

2Bk horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 4

Texture: loam or clay loam
Notes: It has 2 to 10 percent rock fragments.

Wolf Point Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Flood plains
Parent material: Alluvium
Slope: 0 to 2 percent
Notes: These soils are calcareous.

Taxonomic class: Fine, smectitic, calcareous, frigid Torrertic Ustifluvents

Typical pedon:
Wolf Point silty clay loam, 160 feet south and 825 feet east of the northwest corner of sec. 25, T. 132 N., R. 107 W. (Colors are for dry soil unless otherwise stated.)

A1—0 to 1 inch; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; platy structure; soft, friable, sticky and plastic; neutral; abrupt smooth boundary.

A2—1 to 5 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium and fine angular blocky structure; extremely hard, very firm, very sticky and very plastic; neutral; gradual wavy boundary.

A3—5 to 10 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate very fine angular blocky structure; extremely hard, very firm, very sticky and very plastic; slightly alkaline; gradual wavy boundary.

C1—10 to 18 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; extremely hard, very firm, very sticky and very plastic; few masses of lime; slightly alkaline; diffuse wavy boundary.

C2—18 to 29 inches; olive gray (5Y 5/2) clay, olive gray (5Y 4/2) moist; weak fine blocky structure; extremely hard, very firm, very sticky and very plastic; many segregations of gypsum and lime; slightly alkaline; diffuse wavy boundary.

C3—29 to 60 inches; olive gray (5Y 5/2) silty clay, olive (5Y 5/3) moist; massive; very hard, very sticky and very plastic; common segregations of gypsum and lime; slight effervescence; moderately alkaline.

Range in Characteristics

Depth to lime: 0 to 10 inches
Notes: Some pedons have Ab horizons.

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 1 or 2

C horizon:
Value: 5 to 7, 4 to 6 moist
Texture: silty clay loam, silty clay, or clay
Notes: Some pedons have coarser textures below depths of 40 inches.

Yawdim Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Slow
Landform: Ridges and pediments
Parent material: Residuum
Slope: 3 to 25 percent
Notes: These soils are calcareous.

Taxonomic class: Clayey, smectitic, calcareous, frigid, shallow Aridic Ustorthents

Typical pedon:
Yawdim silty clay, 910 feet south and 375 feet west of the northeast corner of sec. 34, T. 130 N., R. 104 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 3 inches; gray (N 5/0) silty clay, dark grayish brown (2.5Y 4/2) moist; weak fine subangular blocky structure parting to moderate fine granular; very hard, friable, sticky and plastic; many roots; slightly alkaline; clear smooth boundary.

C1—3 to 9 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; few fine distinct light olive brown (2.5Y 5/4) moist mottles; weak coarse prismatic structure parting to moderate medium and fine subangular blocky; very hard, firm, sticky and plastic; common fine roots; common pores; slight effervescence; moderately alkaline; clear wavy boundary.

C2—9 to 15 inches; light gray (5Y 7/1) silty clay, gray (5Y 5/1) moist; weak medium angular blocky structure parting to weak fine platy; very hard, firm, sticky and plastic; few roots; few pores; few masses of carbonates; slight effervescence; moderately alkaline; clear wavy boundary.

Cr1—15 to 22 inches; light gray (5Y 7/2) partly weathered soft platy shale which crushes to silty clay; few roots between plates; slight effervescence; many gypsum crystals; few masses of carbonates; gradual boundary.

Cr2—22 to 60 inches; pale yellow (5Y 7/3) and light gray (5Y 7/1) platy shale; light yellowish brown (10YR 5/4) and black (10YR 2/1) stains on faces of plates; slight effervescence.

Range in Characteristics

Depth to soft bedrock: 10 to 20 inches.
10 to 40 inch particle-size control section: The soil is silty clay loam, clay loam, silty clay, or clay averaging between 35 and 50 percent clay throughout.

A horizon:
Hue: 10YR, 2.5Y, or neutral
Value: 5 or 6, 3 or 4 moist

C horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 5 to 8, 4 to 6 moist
Chroma: 1 to 4

Cr horizon:
Notes: It is soft, calcareous siltstone or shale.

Zahl Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Till plains and moraines
Parent material: Glacial till
Slope: 3 to 60 percent
Notes: These soils are highly calcareous.

Taxonomic class: Fine-loamy, mixed, superactive, frigid Typic Calciustolls

Typical pedon:
Zahl loam, 2,335 feet east and 25 feet south of the northwest corner of sec. 14, T. 156 N., R. 90 W. (Colors are for dry soil unless otherwise stated.)

A—0 to 5 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to weak medium granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many fine pores; strong effervescence; slightly alkaline; clear wavy boundary.

Bk—5 to 20 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; many fine pores; few pebbles; many masses of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

C—20 to 60 inches; light yellowish brown and light olive brown (2.5Y 6/4 and 2.5Y 5/4) clay loam, olive brown and light olive brown (2.5Y 4/4 and 2.5Y 5/4) moist; common fine faint olive gray (5Y 5/2) dry and common fine distinct gray (5Y 5/1) dry redoximorphic depletions; massive; soft, friable, sticky and plastic; few very fine roots to 40 inches; few pebbles; strong effervescence; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 10 inches
Depth to lime: 0 to 9 inches

Ap horizon:
Hue: 10YR or 2.5Y
Value: 2 or 3, 3 to 5 dry

Bk horizon:
Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 6, 5 to 7 dry
Chroma: 2 to 4
Texture: loam or clay loam

C horizon:
Value: 4 to 6, 5 to 7 dry
Chroma: 2 to 4
Texture: loam or clay loam

Agronomy

About 30 percent of McKenzie County is cultivated. In 2004, acreage planted to the principle close-grown crops were as follows: spring wheat, 78,000 acres; durum wheat, 113,000 acres; canola, 6,000 acres; barley, 44,000 acres; and oats, 22,500 acres. The main row crops were sugarbeets and corn. Sugarbeets were planted on 10,700 acres and corn on 5,500 acres. Alfalfa and other hay crops were grown on 93,000 acres. Small acreages were planted to winter wheat, buckwheat, mustard, flax, millet, safflower, and dry edible beans (NDAS, 2005).

Cropland limitations and general management practices needed for crops and hay and pasture are discussed in this section. Soil interpretive groups used by the Natural Resources Conservation Service for important farmlands, soil productivity indexes, land capability, pasture and hay, and windbreaks are explained. Soil quality and the management of saline and sodic soils are also discussed.

Planners of management systems for individual fields or farms should consider obtaining specific information from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Cropland Limitations and Management

Management concerns affecting the use of detailed map units in the survey area for crops are shown in the “Potential Cropland Limitations and Hazards” table. The primary concerns in managing cropland are conserving moisture, controlling wind and water erosion, and maintaining or improving soil fertility and tilth.

Moisture at planting time is critical to the success of the crop during the growing season. In years where the amount of available soil moisture is low at planting time, crop success for the year is greatly reduced. Measures that reduce evaporation and runoff rates, increase the rate of water infiltration, and control weeds conserve moisture.

Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, trapping snow, and leaving crop residue on the surface also conserve moisture. When fallow is used to carry moisture over to the next season, a cover of crop residue is essential during winter to guard against moisture loss and erosion.

Wind erosion may be a hazard on most of the soils in McKenzie County. It is severe on the coarse textured and moderately coarse textured soils. These are primarily the Beisigl, Chinook, Dooley, Flasher, Glendive, Rhame, Tally, and Vebar soils. Certain soils have a relatively high content of lime. They are primarily the Cabba, Cabbart, Chama, Havre, Havrelon, Korchea, Lambert, Lonna, Maschetah, Patent, and Zahl soils. They are susceptible to wind erosion in the spring if they have been bare throughout the winter. Because of freezing and thawing, soil structure can break down, resulting in aggregates that are susceptible to movement. This can also cause fine textured soils such as Grano, Heil, Hoffmanville, Lallie, Lawther, Moreau, Scorio, Wayden, and Wolf Point to have a severe wind erosion hazard. Nearly all soils can be damaged by wind erosion if they are not protected by residue.

Water erosion is a severe hazard on gently rolling and steeper soils, such as Beisigl, Cabba, Cabbart, Chama, Cherry, Dogtooth, Flasher, Janesburg, Lonna, Vebar, Williams, and Zahl. The hazard is greatest when the surface is bare.

Conservation practices that control both wind and water erosion are those that maintain a protective cover on the surface. An example is conservation tillage systems that keep a protective amount of crop residue on the surface. Applications of approved herbicides can help to eliminate the need for summer fallow tillage. Cover crops are also effective in controlling both wind and water erosion. Field windbreaks, annual vegetative barriers, and stripcropping help to control wind erosion. Inclusion of grasses and legumes in the cropping sequence, grassed waterways, diversions, terraces, contour farming, and field stripcropping across the slope help to control water erosion. A management system that includes several measures is the best means of protecting the soil. For example, conservation tillage can control soil blowing during years when the amount of crop residue is adequate, but windbreaks are needed during years when the amount of residue is low.

Measures effective in maintaining or improving soil fertility and tilth include utilizing a nutrient management system that includes applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Wind and water erosion reduce productivity of soils. If the surface layer is lost, most of the available plant nutrients also are lost. As a result, applications of fertilizer are needed to maintain adequate crop production.

Of equal concern is the loss of organic matter through erosion. Soil structure, water infiltration, available water capacity, and tilth are all negatively affected by this loss. As organic matter is lost and the subsoil is exposed and tilled, the remaining soil becomes increasingly susceptible to both wind and water erosion. Controlling erosion helps prevent loss of organic matter and plant nutrients and helps maintain productivity. The level of fertility may be reduced even in areas where erosion is controlled. All soils used for crops generally respond well to a nutrient management system. Proper management of soils includes measures that maintain good tilth. These measures are especially needed on the Belfield, Daglum, Desart, Dogtooth, Ekalaka, Gerda, Janesburg, Maltese, Niobell, Noonan, Rhoades, and Scairt soils that have a sodic subsoil and on the Hoffmanville, Lawther, Lohler, Moreau, Scorio, Wayden, and Wolf Point soils that have a silty clay surface layer. Measures that maintain the content of organic matter are very important if good tilth is to be maintained. The traditional practice of clean-tilled summer fallow contributes to the loss of organic matter partly because it increases the susceptibility to erosion.

Additional limitations and management practices are as follows:

Alkalinity. This limitation reduces availability of selected nutrients and is associated with restricted seedling emergence and water infiltration. This limitation can be reduced with a nutrient management system and timely tillage operations. Tilling when the soil is neither too wet nor too dry helps to maintain tilth and prevent surface compaction. Maintaining crop residue on the surface and adding organic material to the plow layer help increase organic matter, prevent surface crusting, and maintain or improve tilth and fertility.

This limitation exists if the soil's pH is more that 7.8 at the surface.

Areas of rock outcrop. These areas are usually not accessible for cultivation and generally are unsuited to cultivated crops and hay and pasture. Farming around these areas may reduce the impact of this limitation on farming operations.

This limitation exists if "rock outcrop" is included in the name of the map unit.

Channels. These areas consist of meandering streams and oxbows. Most areas are isolated by streams or are irregularly shaped and often have standing water in the spring. These areas generally are unsuited to cultivated crops.

This limitation exists if "channeled" is included in the name of the map unit.

Dense layer. This limitation slows water infiltration and restricts root penetration. It can be managed by using a cropping system that includes deep-rooted legumes, such as alfalfa and sweetclover, and deep tillage to improve root and water penetration. Incorporating organic material into the soil also helps to improve root and water penetration.

This limitation exists if the bulk density is greater than 1.7 in any soil layer.

Depth to rock. This limitation restricts rooting depth. It can be managed by planting shallow-rooted, moisture-efficient crops adapted to the area. A moisture conservation program may be effective on these areas. Some areas that are less than 20 inches to bedrock are not suitable for cultivated crops.

This limitation exists if soft or hard bedrock is within a depth of 40 inches.

Depth to sand and gravel. This limitation restricts rooting depth and may increase the potential for pesticide and nutrient leaching. It can be managed by planting shallow-rooted, moisture-efficient crops adapted to the area. A moisture conservation program may be effective in these areas. Some areas less than 12 inches to sand and gravel are not suitable for cultivated crops.

This limitation exists if there is more than 35 percent gravel in any soil layer at a depth of less than 40 inches.

Excessive saturated hydraulic conductivity. This limitation may cause deep leaching of nutrients and pesticides. A nutrient and pesticide management system with a moisture conservation program, which includes following pesticide labels and fertilizing based on soil nutrient tests, can help manage these areas. Some areas may be unsuitable for cultivated crops.

This limitation exists if the saturated hydraulic conductivity of any soil layer is 6 inches per hour or more.

Flooding. This limitation can affect the timely seeding and survival of crops. In some situations this limitation can be managed by protecting the soil from flooding by diking or by building water retention structures and by planting vegetation that is adapted to flooded conditions. Some areas may be unsuitable for cultivated crops or protection measures may not be economical.

This limitation exists if the map unit is either occasionally flooded for long or very long periods or frequently flooded.

Gullies. This limitation makes cultivation difficult and hazardous. Generally, gullies are so deep that extensive reshaping is necessary for most uses. They generally are unsuited to cultivated crops, hay, and pasture.

This limitation exists if “gullied” is included in the name of the map unit.

High sodium content. This limitation restricts root, air, and water penetration in the subsoil. It may cause poor tilth and compaction. Tillage at the proper moisture content helps to maintain tilth. Tillage that loosens the dense, sodic subsoil or growing deep-rooted legumes, such as alfalfa and sweetclover, may improve soil physical conditions. For additional information about managing these soils see “Management of Saline and Sodic Soils.”

This limitation exists if the sodium adsorption ratio (SAR) is more than 15 within a depth of 30 inches or if the soil is classified as an Aridic Leptic, Leptic, Leptic Vertic, Leptic Torrertic, Torrertic, Udic, or Vertic Natrustolls.

High water table. Wetness in undrained areas can delay tillage, seeding, and harvest operations in most years and prevent them in some years. Drained areas are suited to cultivated crops but locating suitable drainage outlets generally is difficult. Planting crops that are tolerant to wetness minimizes the impact of the high water table.

This limitation exists if the water table is within a depth of 36 inches.

Lime content. High lime content at the surface may cause increased wind erosion and surface crusting. It may also reduce availability of selected nutrients. This limitation can be managed by a system of conservation tillage that leaves crop

residue on the surface, field windbreaks, stripcropping, and annual buffer strips to help control wind erosion. Field windbreaks planted on slopes greater than 8 percent may contribute to water erosion by concentrating spring runoff. Crops may respond well to a nutrient management system that includes additions of phosphate fertilizer.

This limitation exists if the soil is assigned to wind erodibility group 4L or has more than 5 percent $CaCO_3$ in the upper 10 inches.

Limited available water capacity. This limitation reduces the capacity of the soil to retain moisture for plant use. A moisture conservation program can help manage these areas.

This limitation exists if the available water capacity calculated to a depth of 40 inches or to a root-limiting layer is 6.3 inches or less or the electrical conductivity (EC) is more than 8 at less than 30 inches and the soil is moderately well drained or better.

Limited organic matter. This limitation may cause an increase in surface crusting and reduce the soil's natural fertility. Soil organic matter can be managed by utilizing a nutrient management system, incorporating crop residue or green manure crops into the soil, and using proper crop rotations.

This limitation exists if the content of organic matter is 1 percent or less in the surface layer.

Pesticide and nutrient leaching. This limitation increases the hazard of contaminating aquifers, springs, and local water tables. A nutrient and pesticide management system with a moisture conservation program, which includes following pesticide labels and fertilizing based on soil nutrient tests, can help manage these areas. Some areas may be unsuitable for cultivated crops.

This limitation exists if the depth to the water table is 48 inches or less, depth to bedrock is less than 60 inches, or saturated hydraulic conductivity of any soil layer is 6 inches per hour or more.

Pesticide and nutrient runoff. This limitation increases the hazard of contaminating surface waters, such as lakes, ponds, steams, and rivers. It can be managed with nutrient, pesticide, and conservation tillage systems which include leaving crop residue on the surface, following pesticide labels, and fertilizing based on soil nutrient testing. Limiting row crops on slopes of more than 8 percent reduces the rate of runoff of pesticides and nutrients. Runoff from upland areas can concentrate pesticides on ponded soils. Draining ponded areas may adversely affect the receiving surface waters.

This limitation exists if the soil is occasionally flooded or frequently flooded; is subject to ponding; is assigned to hydrologic group C or D and has a slope of more than 2 percent; is assigned to hydrologic group A and has a slope of more than 6 percent; or is assigned to hydrologic group B, has a slope of 3 percent or more and has a K factor of more than 0.17.

Ponding. This limitation can affect the timely seeding, harvesting, and survival of crops. Because of wetness and ponding, this soil generally is unsuited to cultivated crops, hay and pasture, and range.

This limitation exists if ponding occurs on the soil.

Poor tilth and compaction. This limitation restricts seedling emergence and water infiltration. It can be managed by timely tillage operations, maintaining crop residue on the surface, and adding organic material to the plow layer to increase soil organic matter. A cropping system that includes deep-rooted legumes, such as alfalfa and sweetclover, may improve root and water penetration.

This limitation exists if the upper 10 inches of the soil has more than 35 percent clay; has less than 1 percent organic matter; or has SAR of 5 or more.

Restricted saturated hydraulic conductivity. This limitation restricts root penetration and water saturated hydraulic conductivity. It can be managed with timely tillage operations and by using a cropping system that includes deep-rooted

legumes, such as alfalfa and sweetclover, to improve root and water penetration. Incorporating organic material into the soil also helps to improve root and water penetration.

This limitation exists if saturated hydraulic conductivity is 0.06 inch per hour or less within a depth of 40 inches.

Root limiting. This limitation reduces the effectiveness of roots when the soil dries and increases moisture stress during extended dry periods. It can be managed with a cropping system that includes deep-rooted legumes, such as alfalfa and sweetclover, and deep tillage to improve root and water penetration in the subsoil. Tillage when the soil is neither too wet nor too dry helps to maintain tilth. A moisture conservation system may be beneficial. For additional information about managing these soils see "Management of Saline and Sodic Soils."

This limitation exists if the soil is classified as a Glossic Natrustoll.

Salt content. This limitation interferes with plant growth by restricting nutrient uptake and reducing available water. Using nutrient management and moisture conservation systems and growing salt-tolerant crops, such as barley, can help manage these areas. For additional information about managing these soils see "Management of Saline and Sodic Soils."

This limitation exists if the soil has an EC of more than 4 in the surface layer or more than 8 within a depth of 30 inches.

Slickspots. The surface of these areas is non-vegetated and tends to puddle upon wetting. Slickspots are restrictive to air and water saturated hydraulic conductivity and root growth. These areas are best suited to range. Because of the dense and massive layers, they generally are unsuited to cultivated crops, hay, and pasture. For additional information about managing these soils see "Management of Saline and Sodic Soils."

This limitation exists if "Slickspots" is included in the name of the map unit.

Slope. This limitation increases the potential for accelerated water erosion unless conservation farming practices are applied.

This limitation exists if the upper slope range of the map unit is more than 8 percent.

Soil slumping. This limitation indicates a potential for mass soil movement. These areas generally are unsuited to cultivated crops, hay, and pasture.

This limitation exists if the slope is more than 35 percent and the surface or subsoil has more than 35 percent clay; or if the slope is more than 25 percent and the subsoil contains more than 35 percent clay and bedrock is at a depth of less than 60 inches; or if "slumped" is a modifier of any named component of the map unit.

Surface crusting. This limitation restricts seedling emergence and water infiltration. It can be managed with a system of conservation tillage that leaves crop residue on the surface and by incorporating organic material into the surface layer.

This limitation exists if the surface texture is silt, silt loam, silty clay loam, or very fine sandy loam and the surface layer organic matter content is less than 3 percent; or if the surface texture is loamy very fine sand, very fine sandy loam, fine sandy loam, sandy loam, sandy clay loam, loam, clay loam, silt, silt loam, or silty clay loam and the surface layer Calcium Carbonate Equivalent ($CaCO_3$) is equal to or greater than 1; or if the surface layer or upper 10 inches has a SAR of 4 or more.

Surface rock fragments. This limitation adversely affects the use of mechanical equipment for cultivation and causes rapid wear of tillage equipment and difficult seedbed preparation. It cannot be easily overcome. These areas are generally unsuited to cultivated crops, hay, and pasture.

This limitation exists if the texture of the surface layer includes any rock fragment modifier except for gravelly or channery and "surface stones" are not already indicated as a limitation.

Surface stones. This limitation restricts normal cultivation practices. These areas are generally unsuited to cultivated crops, hay, and pasture. Economic removal of the surface stones generally is not feasible.

This limitation exists if the surface layer texture includes stony or bouldery modifiers or if “stony” or “bouldery” are included in the map unit name.

Water erosion. This limitation indicates an increased hazard of water erosion. This limitation can be managed by a system of conservation tillage that leaves crop residue on the surface, contour stripcropping, and grassed waterways in areas where runoff concentrates.

This limitation exists if the surface K factor (soil erodibility factor) multiplied by the upper slope percent is more than 2.

Wind erosion. This limitation indicates an increased hazard of wind erosion. This limitation can be managed by using a system of conservation tillage that leaves crop residue on the surface, field windbreaks, stripcropping, annual crop barriers, and a cropping sequence that includes grass-legume hay.

This limitation exists if the wind erodibility group is 1, 2, 3, 4, or 4L.

Erosion Factors

Soil erosion factors are used with other information to estimate the amount of soil lost through water and wind erosion. The procedure for predicting soil loss is useful in guiding and comparing the selection of soil and water conservation practices. The soil erodibility factors (K and Kf), the soil-loss tolerance factor (T), wind erodibility index (I), and wind erodibility groups (WEG) are described in “Physical Properties” in the “Soil Properties” section. Additional information about soil factors affecting wind and water erosion can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service.

Productivity Indexes and Crop Yield Estimates

Productivity indexes are relative ratings of the ability of a soil to produce a particular crop yield in comparison to other soils. They are useful in estimating long-term average crop yields, comparing the production capacity of soils, and in various economic analyses. Productivity indexes are shown in the “Map Unit Productivity Index and Farmland Designation” table. Productivity indexes are given for drained conditions and, where applicable, undrained conditions. The average yields per acre that can be expected of the principal crops grown in the county under a high level of management are shown in the “Yields per Acre of Crops” table.

Productivity indexes are based on soil properties important to crop production. Knowledgeable and experienced soil scientists, conservationists, and university researchers developed the indexes. They used results from field trials, demonstrations and records, and experiences of producers (Ulmer and Patterson, 1988 a, b, c). In North Dakota, productivity indexes are based on long-term average spring wheat production. Similar and contrasting map unit inclusions are considered along with the named map unit components when the productivity index is calculated. The index ranges from 0, which indicates no long-term economic production, to 100, which indicates the highest potential production. Productivity indexes are based on the best available information, but they are difficult to determine for soils with variable properties such as salinity, sodicity, and degree of drainage.

In McKenzie County, a productivity index of 100 was considered equal to a long-term average yield of 37 bushels per acre of spring wheat. Multiplying the productivity index by 37 and dividing the product by 100 converts the index number to a figure representing the expected long-term average yield per acre. For example,

map unit 42B, Williams-Zahl loams, 3 to 6 percent slopes, has a productivity index of 76. This number multiplied by 37 and then divided by 100 converts to 28, which is the expected long-term average yield of spring wheat in bushels per acre for this map unit. In any given year, yields may be higher or lower than those indicated in the table because of variations in management, rainfall, and other production and climatic factors. Estimated yields reflect the production capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. Productivity of a given soil compared with that of other soils, however, is not likely to change.

Management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include nutrient management systems, moisture conservation, and conservation tillage.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreages of such crops are small. The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Prime Farmland and Other Important Farmland

In this section, prime farmland and other important farmland are defined. The map units in the survey area that are considered prime farmland, farmland of statewide importance, or other land are listed on the “Map Unit Productivity Index and Farmland Designation” table. Most map units have minor areas or inclusions that do not meet the listed farmland designation. More information about the criteria for prime farmland and other important farmland can be obtained at the local office of the Natural Resources Conservation Service.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban, built-up land, or water areas. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce sustained high yields of crops in an economic manner.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods and it is not frequently flooded during the growing season or it is protected from flooding. The slope ranges mainly from 0 to 6 percent.

Soils with a seasonal high water table may qualify as prime farmland where this limitation is overcome by drainage measures. Onsite evaluation is necessary to determine the effectiveness of corrective measures.

A recent trend in land use in some parts of the nation has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive.

About 2,475 acres, or less than .001 percent of the survey area, meets the requirements for prime farmland. The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the sections “Detailed Map Units” and “Soil Series and Their Morphology.”

Farmland of Statewide Importance

Some areas, other than areas of prime farmland, are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by appropriate state and federal agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed with acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable.

Other Land

Lands not meeting the criteria for Prime Farmland or Farmland of Statewide Importance are placed into Other Land on the “Map Unit Productivity Index and Farmland Designation” table.

This group includes Additional Farmland of Local Importance, Unique Farmland, and Other Land. These farmlands may have agricultural or nonagricultural uses.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. Soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. Criteria used in grouping the soils do not take into account extensive and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, woodland, or engineering purposes. The capability classification of each map unit is given in the “Interpretive Groupings Report” table.

In the land capability system, as described in “Land Capability Classification” (USDA-SCS, 1961), soils generally are grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. Capability classes are given for drained conditions and, where applicable, undrained conditions.

Capability classes, the broadest groups, are designated by numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants and require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, such as wetness, that are impractical to remove and limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are designated by adding the letter, **e**, **w**, **s**, or **c**, to the class numeral, for example, 2e. The letter **e** shows the main hazard is the risk of erosion unless a close-growing plant cover is maintained; **w** shows that water in or on the soil interferes with plant growth or cultivation (in some soils wetness can be partly corrected by artificial drainage); **s** shows the soil is limited mainly because it is droughty, stony, or saline; and **c**, used in only some parts of the United States, shows the chief limitation is climate that is very cold or very dry.

There are no subclasses in class I because soils of this class have few limitations. Class 5 contains only the subclasses indicated by w, s, or c because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use mainly to pasture, rangeland, woodland, wildlife habitat, or recreation. There are no subclasses in class 8.

Forage Suitability Groups

Pastureland is land devoted to the production of adapted introduced or native forage plants for grazing by livestock. Hayland is land primarily used for the production of hay from long-term stands of adapted forage plants. Both pastureland and hayland receive cultural treatments to enhance forage quality and yields. Because of the relatively short growing season, some producers have established cool-season tame pasture to complement the forage produced on rangeland and to extend the grazing season in the spring and fall.

Generally, large amounts of hay are needed to maintain livestock through the long, harsh winters. Hay was harvested on about 93,000 acres in McKenzie County in 2004 (NDAS, 2005).

Proper pasture or hayland management is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing management on pastureland during the growing season helps plants maintain sufficient and vigorous top and root growth for sustained production. Brush and weed control is essential in many areas. Fertilizer increases production and enhances longevity of stands. Rotation grazing and renovation also are important management practices.

Soils are assigned to forage suitability groups according to their suitability for production of forage under intensive management. Soils in each suitability group are similar enough to be suited to the same species of grasses or legumes. They also have similar management concerns, productivity levels, and limitations and hazards.

Forage suitability groups are given in the “Interpretive Groupings Report” table. They are given for drained conditions and, where applicable, undrained conditions. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information on adapted varieties and forage yields.

The following paragraphs describe the Forage Suitability Groups in Major Land Resource Areas (MLRAs) 54 and 58C which include McKenzie County. They specify the production potential under improved management and list representative adapted species for each group. More detailed information is available in Section II of the electronic Field Office Technical Guide (eFOTG) at www.nrcs.usda.gov/technical/efotg.

Clayey Subsoil. These soils are deep and moderately well and well drained. They are medium to fine textured soils on uplands. They have a claypan that is a moderate restriction to root growth. Otherwise, these soils have few limitations for the management and growth of adapted plants. Production potential is moderate to high. Suitable forage species include crested wheatgrass, smooth bromegrass, Russian wildrye, intermediate and pubescent wheatgrass, western wheatgrass, green needlegrass, alfalfa, and sweetclover.

Claypan. These soils are deep and somewhat poorly to well drained. They are moderately coarse to fine textured soils on uplands. The claypan is dense with very little root penetration. Typically these soils are strongly alkaline in the claypan and below. These soils are saline below 16 inches. Production potential is low. Suitable forage species include western wheatgrass, slender wheatgrass, crested wheatgrass, alfalfa, and sweetclover.

Droughty Loam. These soils are very deep and mostly well drained. They are moderately coarse to medium textured soils on glacial outwash plains, alluvial fan remnants, terraces, and flood plains. The moderate available water capacity limits plant growth during periods of moisture deficit. Production potential is moderate. Suitable forage species include crested wheatgrass, green needlegrass, Russian wildrye, slender wheatgrass, western wheatgrass, blue grama, prairie sandreed, sand bluestem, alfalfa, and sweetclover.

Limy Upland. These soils are well drained. They are moderately fine to medium textured soils on till plains, fans, and terraces. The high lime content close to the soil surface reduces the availability of some plant nutrients. Production potential is moderate. Suitable forage species include crested wheatgrass, slender wheatgrass, western wheatgrass, blue grama, little bluestem, prairie sandreed, and sideoats grama.

Loam. These soils are mostly very deep and well drained. They are moderately coarse to moderately fine textured soils on terraces, fans, and flood plains. These soils have few limitations to the production of climatically adapted forage crops. Production potential is moderate to high. Suitable forage species include Altai wildrye, crested wheatgrass, green needlegrass, intermediate wheatgrass, Russian wildrye, big bluestem, blue grama, switchgrass, alfalfa, and purple prairieclover.

Overflow. These soils are very deep and mostly moderately well drained. They are moderately coarse to moderately fine textured soils on stream terraces, fan remnants, and flood plains and in swales and drainageways on uplands. These soils have few limitations to the production of climatically adapted forage crops. Production potential is high. Suitable species include Altai wildrye, crested wheatgrass, green needlegrass, Russian wildrye, western wheatgrass, big bluestem, sideoats grama, switchgrass, alfalfa, and sweetclover.

Sand. These soils are deep and moderately well to excessively drained. They are coarse textured soils on uplands and flood plains. Wind erosion is a severe hazard during establishment and renovation. Production potential is moderate to high. Species selection is limited for pasture and hayland. Suitable forage species include sand bluestem, switchgrass, prairie sandreed, intermediate and pubescent wheatgrass, and alfalfa.

Saline. These soils are very deep, moderately well to somewhat poorly drained, coarse to fine textured and moderately saline. The available water capacity is moderate because of salinity. Plant species are those with moderate to high salt tolerance. Severely affected areas will need to be seeded and then mulched to reduce salt concentrations during seedling establishment. Production ranges from low to moderate. Suitable forage species include western wheatgrass, slender wheatgrass, switchgrass, Newhy hybrid wheatgrass, alsike clover, and sweetclover.

Steep Loam. These soils are very deep and well drained. They are medium textured soils on moderately steep or hilly upland positions. The slope of these soils ranges from 15 to 25 percent resulting in high and very high runoff potential and the potential for water erosion. Production potential is moderate. Suitable forage species include Altai wildrye, crested wheatgrass, intermediate wheatgrass, Russian wildrye, blue grama, little bluestem, prairie sandreed, alfalfa, and sweetclover.

Subirrigated. These soils are medium textured and somewhat poorly drained soils. They are on lake plains, surrounding shallow depressions, and on slight rises.

They have a seasonal water table within 12 to 48 inches of the surface during part of the growing season. These soils have few limitations. Production potential is high. Suitable species include crested wheatgrass, slender wheatgrass, tall wheatgrass, western wheatgrass, big bluestem, little bluestem, switchgrass, alfalfa, and sweetclover.

Very Droughty Loam. These soils are moderately deep to very deep and well to excessively drained. They are on uplands, pediments, terraces, and flood plains. The moderate depth to sand and gravel results in low available water capacity and limits species selection and production potential. Production potential is moderate. Suitable species include crested wheatgrass, Siberian wheatgrass, blue grama, purple prairieclover, and white prairieclover.

Very Shallow to Gravel. These soils are deep and well to excessively drained. They are medium to moderately coarse textured soils on outwash plains and scoria topped buttes. They typically have coarse sand and gravel or shattered porcelanite at depths of less than 14 inches. These soils are very droughty. Production potential is low and species selection is severely limited. Suitable species include crested wheatgrass, western wheatgrass, thickspike wheatgrass, and slender wheatgrass. Where cultivated, returning these soils to rangeland may be a better alternative than pasture or hayland.

Wet. These soils are deep and poorly drained. They are coarse to fine textured soils on flood plains or low areas on till and lake plains. Wetness limits selection of locally adapted forage plants. Production potential is high to very high. Select plant species on the basis of flooding tolerance or inundation tolerance. Suitable species include reed canarygrass, creeping foxtail, big bluestem, switchgrass, indiangrass, western wheatgrass, intermediate and pubescent wheatgrass, smooth bromegrass, tall wheatgrass, and alsike clover.

Not Assigned. Not assigned indicates current site specific information is not adequate and a field visit is necessary for planning purposes. Included in this forage suitability group are miscellaneous land types.

Not Suited. These soils have severe limitations that make their use for forage production impractical or impossible. They are too steep, shallow, wet, or stony or possess unfavorable chemical properties for forage production. This rating would generally indicate a range seeding is recommended for planning purposes.

Management of Saline and Sodic Soils

Saline and sodic soils make up about 13 percent of McKenzie County. Saline soils make up about 1,300 acres; sodic soils make up about 152.000 acres; and saline-sodic soils make up about 7,200 acres.

Saline soils have a high concentration of soluble salts, or salts that dissolve in water. Saline soils in McKenzie County are indicated by a spot symbol (+). Each of these areas are 1/4 to 3 acres in size and are scattered throughout the county. Saline soils in McKenzie County are phases of the Havrelon and Lohler series.

Saline soils generally develop in areas of restricted drainage, such as those adjacent to sloughs and waterways. Where drainage is poor, salts rise with the water table and are concentrated near the surface. This salt buildup is reduced by plants and a surface cover. The plant roots use the soil water before it can reach the surface and before the salts accumulate. The surface cover prevents evaporation at the surface, the upward movement of water in the soil, and the concentration of salts at the surface (Seelig and Richardson, 1991).

Plants growing on saline soils absorb salts from the soil water. Excess amounts of certain salts may interfere with plant growth. High concentrations of some salts are toxic to certain plants. Some salts cause nutritional imbalances or deficiencies by

restricting the uptake or availability of certain plant nutrients. Detecting salinity by visual observations in the field is difficult. The salts are generally not visible during much of the growing season, particularly when the soil is moist. Flecks, threads, or masses of soluble salts are usually visible when the soil is dry. Laboratory analysis or special field instruments are needed to determine the actual degree of salinity in soils.

Crop response, particularly during periods of soil moisture stress, is a useful indicator of the degree of salinity in saline soils. For instance, a small grain crop growing on saline soils tends to be stunted and has fewer tillers than small grain on nonsaline soils. Strongly saline soils are best suited to native grasses or to salt-tolerant introduced grasses. Slightly saline or moderately saline soils can produce salt-tolerant crops and forage. Barley is the most salt-tolerant of the small grains. Of the forage crops, tall wheatgrass, western wheatgrass, and alfalfa are salt tolerant once they are established. Continuous cropping is beneficial because it reduces evaporation and salt accumulation in the surface layer.

Sodic soils are characterized by a high content of exchangeable sodium which adheres to the clay particles in the soil (Seelig and Richardson, 1991). The sodic soils in McKenzie County are phases of the Belfield, Daglum, Desart, Dogtooth, Ekalaka, Gerda, Harriet, Heil, Janesburg, Maltese, Niobell, Noonan, Rhoades, and Scairt series. Locally, sodic soils are known as “black alkali,” “slickspots,” “pan spots,” or “gumbo.”

Sodic soils develop in a complex pattern with a very distinct microrelief. The physical and chemical properties of these soils differ markedly within very short distances. In many areas the distance between the sodic soils and the surrounding soils that have normal physical properties is only a few feet.

Sodic soils developed in areas of saline soils that contained large quantities of sodium salts. Over a long period, usually centuries, as the water table lowers, precipitation gradually leaches the salts from the surface to lower horizons. During this leaching process, the clay in the soil becomes saturated with sodium, disperses, and moves downward with the percolating water. As the moving clay concentrates, a dense, sodium affected subsoil forms. The dense subsoil is hard when dry, sticky when wet, and nearly impervious to roots, water, and air.

As the leaching by soil water continues, the sodium is gradually moved lower in the soil profile and eventually is carried below rooting depth. The result is a more manageable soil, such as Belfield. If the leaching process continues and nearly all of the sodium is removed from the profile, the soil eventually changes into a nonsodic soil. This change requires a long period, usually centuries.

If plowed, sodic soils are characterized by a surface layer that is sticky when wet and hard and cloddy when dry. A crust forms easily at the surface. The chemical and physical properties of these soils are unfavorable for plant growth. The harmful effects of the properties on plants generally increase as the sodium content increases. The effects of the reduced amount of water available to plants are more harmful than the toxic effect of the sodium. The plants also are affected by the depth to the dense subsoil.

Identification of sodic soils in cultivated fields commonly is difficult because many of the physical characteristics, such as columnar structure, have been altered by tillage. Crop response, particularly during periods of soil moisture stress, is a useful indicator of the level of sodicity in a soil. Crops grown on soils with varying amounts of sodium exhibit varying heights and stages of development. If the level of sodicity is very high, the crop cannot grow. The effects of sodium on crop growth are influenced by weather conditions, stage of crop growth, and soil moisture status. A measure of the effect of sodicity on vegetative growth is not necessarily a reliable measure of crop yields. In many areas the yields of barley and wheat are affected less than the vegetative growth of these crops.

Variability of sodic soils can cause management problems. Soils that have a dense, sodic subsoil near the surface, such as Dogtooth, Gerda, Rhoades, or Scairt are better suited to grass than to small grain and sunflower. Timely tillage is an important management need in areas of sodic soils. These areas should be tilled and seeded only when the moisture content is favorable. If worked when too wet, the soils puddle and crust. If the soils are tilled when too dry, tillage and seeding implements cannot easily penetrate the soils. Deep plowing and chemical amendments can help to reclaim sodic soils, but they may not be feasible. To be effective, deep tillage should reach below the sodium affected subsoil and mix several inches of the underlying material with the subsoil and topsoil. Depending on the soil, tillage to a depth of 15 to 36 inches may be needed. Any reclamation of sodic soils is a long-term endeavor. Complete reclamation may never be achieved. Onsite investigation is needed to confirm the feasibility of deep tillage in a particular area.

Saline-sodic soils develop in areas of restricted drainage where salts rise with the water table but where some downward leaching of clay and some saturation with sodium are evident and a dense, sodium affected subsoil has formed. An example is the Harriet or Heil soil. The management needs and crop responses on these soils are a combination of those on saline soils and those on sodic soils.

Additional information about management or reclamation of saline and sodic soils is available from the Natural Resources Conservation Service, the North Dakota Agricultural Experiment Station, and the Cooperative Extension Service (Franzen, et. al., 1994).

Soil Quality

Definition of Soil Quality

Soil quality is the ability of a soil to function within its surroundings, support plant and animal productivity, and maintain or enhance water and air quality. This is also referred to as soil health.

Functions of Soil

Soil is a living, dynamic resource. It has biological, chemical, and physical properties which are continually changing. Soil provides a physical, chemical, and biological environment for the exchange of water, air, and nutrients necessary for living organisms.

Soil controls the movement of rainfall or irrigation water on the land. Some of the water runs off the soil and directly enters surface water drainage systems. The remaining water either evaporates or infiltrates the soil. There it is stored and used for plant growth or percolates through the soil into the ground water. This control of water flow affects the movement of soluble materials, such as nitrate nitrogen and pesticides, through the environment.

Soil regulates biological activity and chemical exchanges. This affects nutrient cycling, plant growth, and decomposition of organic materials. Soil also acts as a filter to protect the quality of water and air. It provides mechanical support and a rooting environment for living organisms.

Soil quality can be viewed in two ways: In the first view, some soils are better suited than others to perform specific functions. For example, soils that are shallow to bedrock are poorly suited for supporting deep-rooted crops or trees. Soils high in sand and gravel content may have an inherently poor quality for filtering septic system wastes. Alternatively, these same soils may have a high quality or suitability for road and street construction. This view of soil quality is useful when comparing soils and is often used to evaluate the suitability of soils for specific uses.

The second view of soil quality relates to the dynamic nature of soils. Even though a soil may have a certain ability or level of quality for a specific activity, it may be functioning at a level below its inherent capability. This may be due to past disturbance or current management systems. For example, a farming system that does not protect the surface layer from erosion may result in soil erosion and loss of organic matter, nutrients, and other beneficial properties. In most cases, the eroded soil functions at less than its original potential for production. Its condition or health is considered impaired or lower in quality. In another example, a soil in a wetland, if drained or covered with sediment from nearby uplands, may not serve as effectively as a filter as it would in its natural condition.

Importance of Soil Quality to Landowners

Soil quality has a direct affect on plant growth and productivity for crop, range, hay, and woodland production. It affects how water moves into and through the soil. Maintaining or enhancing soil quality can help reduce the negative effects of soil erosion. Increasing soil quality can reduce the movement of nitrates and other chemicals to adjacent water bodies and ground water. Maintaining a high level of soil quality will ensure the soil resource is sustained for the future.

Many soils have undergone a degradation of their inherent quality through past agricultural operations. However, improved management practices, such as conservation tillage, implementing nutrient and moisture management systems, and establishment of riparian buffers or windbreaks can improve soil quality. As a rule, management practices that maintain a vegetative cover on the soil, return the maximum practical amount of residue, and minimize soil disturbance (tillage), will result in higher levels of soil quality.

Degradation of soil quality can have negative effects on the soil resource and costly off-site impacts. Soil erosion and the consequential deposition of sediment by wind or water are examples. Other negative effects of soil degradation include: compaction and loss of granular structure of surface soil layers, reduction of infiltration rates and organic matter levels, and formation of surface crusts. Degradation of soils can also lead to nutrient loss or imbalances, pesticide carryover, and reduced biological activity.

Soil Quality Indicators

The quality of most soils can be improved over time if managed properly. Key indicators of soil quality can be observed and monitored periodically to ensure the quality of the soil is maintained or enhanced.

Soil quality indicators are soil properties or processes that can be monitored to establish changes in the soil. Indicators can be categorized into four general groups: visual (sensory), physical, chemical, and biological.

Visual indicators may be obtained from observation or photographic interpretation. Exposure of subsoils, change in soil color, ephemeral gullies, ponding, plant response, and surface crusting are a few examples. Visual evidence can be a clear indication that soil quality is changing in either a negative or a positive way. The senses of feel and smell can also be used to evaluate certain soil properties.

Physical indicators are usually obtained by observation or field and laboratory analyses. They include topsoil thickness, bulk density, porosity, aggregate stability, texture, crusting, and compaction. These indicators reflect factors affecting root growth, soil biological activity, seedling emergence, and infiltration and movement of water and air within the soil.

Chemical indicators usually require sampling and field or laboratory analyses. They include measurements of pH, salinity, organic matter, phosphorus concentrations, cation-exchange capacity, and nutrients. The chemical condition of

soil affects soil-plant relationships, water quality, buffering capacities, and mobility of nutrients and contaminants.

Biological indicators may be obtained by observation or measurement. They include measurements of micro- and macro-organisms and their activities. Respiration rates to detect microbial decomposition of organic matter and populations of bacteria, fungi, earthworms, nematodes, and mites can be used as biological indicators of soil quality.

Soil quality can be monitored through observation and/or measurement of key soil quality indicators. Soil quality score cards and a test kit (USDA-Soil Quality Institute, 1998) are available to assist in the assessment process. The monitoring program should include several indicators and take into consideration the time of year that sites are monitored, stage of crop growth, and location within the field where observations are made.

Monitoring soil quality should primarily be used to detect trends that are measurable over a 1- to 10-year period. Monitoring trends determines whether the soil is improving, degrading, or remaining steady under the current management system. This allows land managers to detect problems before undesired and possibly irreversible loss of soil quality occurs.

The local office of the Natural Resources Conservation Service, Soil Conservation District, or Cooperative Extension Service can help establish a plan for monitoring soil quality.

Woodland, Windbreaks and Environmental Plantings

Native woodland cover in McKenzie County can be found within four generalized locations: Missouri, Little Missouri, and Yellowstone River bottoms; along permanent and intermittent streams; coulees and Missouri River Breaks; and on north and east facing slopes within the Badlands. Isolated pockets of trees and shrubs also occur outside these generalized areas due to favorable site conditions, though total acreage is quite small. Presence or absence of woodland and the composition of woodland is directly related to the amount of water available for establishment and maintenance. Differences in available water of a little as 1-2 inches annually greatly affect woodland composition, health, and vigor. Woodland is described as areas showing at least 15 percent canopy cover of trees and shrubs.

U.S. Forest Service sources indicate that the acreage of woodland today in McKenzie County is probably not much different from 100 years ago. However, the control of wildfire has shifted the woodland composition from predominantly shrubs to predominantly large shrubs and trees.

Woodlands

River Bottom Woodlands Composition of these woodlands is directly related to the ground elevation above average water levels. Elevation differences of six inches to a foot alter conditions enough to affect species composition. Generally, the lowest elevation closest to average water elevation, will be mud flats or herbaceous vegetation since it is too wet to sustain trees and shrubs.

A bit higher on the landscape will be found numerous shrub willows (Sandbar willow, Diamond willow), tree willows (Peachleaf willow, Missouri River willow) and a few scattered cottonwoods.

Slightly higher ground will support a healthy cottonwood forest with the beginning of a green ash understory. Only a few large willows remain in this forest cover. Locations within this forest cover indicate that several feet of silt have been deposited over time.

As the colonization of the site progresses, the willow are completely gone and the cottonwood are mostly over-mature and in a state of decline. American elm, green

ash, and boxelder comprise the understory and are approaching pole size. Ground cover is often bluegrass. Representative forest of this type contained cottonwood of 16-24 inch diameter, 60 feet tall, and spaced 50-70 feet apart. Understory trees, elm, ash, and boxelder, were about 30 years old, 25 feet tall, and 6 inches in diameter. Plenty of sunshine was able to reach the understory and the bluegrass surface vegetation.

As riparian forest matures, the mix shifts to large elm and ash, young elm and ash, a few very large boxelder, and the beginnings of a Rocky Mountain juniper understory. In older riparian forests, bacterial wetwood affected many of the mature elm and cottonwood. White mold fungi (commonly referred to as Fomes) affected many of the green ash.

Riparian forest tree and shrub species along the upper reaches of the Little Missouri River in McKenzie County are being replaced by species more tolerant of arid conditions. Through down cutting of the Missouri River, most of the flood plain where the cottonwoods, elms, and green ash are located is no longer subject to flooding. Many of the mature trees are dead or dying in these areas. In fact, many of these areas have water tables that are no closer to the surface than 5-15 feet. This reduction in accessible water is causing the forest cover to switch to buffaloberry, Rocky Mountain juniper, common juniper, spreading juniper, and drought-tolerant prairie grasses such as sand bluestem, blue grama, and sideoats grama. Natural regeneration of riparian species such as cottonwood, willow, boxelder, and dogwood exists only within the narrow confines of the active stream channel.

Perennial and Intermittent Stream Woodland The larger named streams and intermittent drainages within the county support riparian woodlands for quite a distance upstream from where these streams enter the larger rivers. In some cases these fingers of woodland extend upstream for 5 or more stream miles. Riparian woodlands along these streams are usually narrow (less than 150 feet on either side). Where valley gradient is flatter, increased stream meanders result in a wider band of woodland.

Often these riparian woodlands are found on sites that are productive for grazing and cropping. Some areas have been cleared resulting in discontinuous riparian woodlands.

Predominant species found within these riparian woodlands include green ash, American elm, common chokecherry, boxelder, and snowberry. Herbaceous cover is predominately bromegrass and bluegrass. Other species such as bur oak, buffaloberry, juneberry, and Rocky Mountain juniper may also occur in limited numbers.

Wooded Draws and Missouri River Breaks Generally these areas range from broad, gently sloping northerly aspects found within several miles of the Missouri River to steep narrow valleys located throughout the rest of the county, excluding the Badlands. This woodland cover type constitutes the largest acreage of woodland within the county.

Species mix within any given woodland may vary by site, but generally will contain some or all of the following – aspen, green ash, dogwood, rose, hawthorne, juneberry, plum, buffaloberry, snowberry, silverberry, Rocky Mountain juniper, common juniper, spreading juniper, and bur oak.

Where canopies are somewhat sparse, a variety of native grasses, brome, and bluegrass cover the soil surface. Some of the woodland stands have dense enough canopies to shade out most of the herbaceous vegetation on the soil surface resulting in a forest floor covered with leaf litter and shade-tolerant forest shrubs and forbs.

Species such as aspen, rose, buffaloberry, and snowberry are able to extend the area of forest cover farther up the slopes and out onto the nose slope positions, especially in times of plentiful moisture. As dry cycles occur, these outlying forested

areas will die and the woodlands will retract to sites with more favorable moisture regimes.

Bur oak can be found in isolated stands throughout the eastern part of the county. Where bur oak is part of a stand, it generally occurs as dense pockets of predominantly pure bur oak. Areas of known bur oak are found in and around the Blue Buttes area.

Badlands The primary forest cover type within areas of McKenzie County dominated by Badlands topography consists of a Rocky Mountain juniper complex. In the absence of fire and with enough time, north-facing slopes become forested with solid stands of Rocky Mountain juniper. The addition of fire initiates complex plant species succession. Depending upon intensity, fire can completely remove the existing juniper cover.

Drier sites such as south and west exposures, ridge tops, and nose slope positions may also include clumps of common juniper and prostrate juniper. In the absence of fire for long periods of time, prostrate juniper may completely cover arid west slopes.

When juniper stands are removed by fire, a wide assortment of deciduous trees and shrubs begin colonizing the site. Species such as juneberry, ash, elm, rose, buffaloberry, hawthorne, aspen, dogwood, skunkbush sumac, and snowberry are quick to capture most sites. During these initial stages, the deciduous trees and shrubs provide valuable wildlife food and cover. In some areas, browsing deer keep shrubs pruned for quite a few years.

After years of deciduous tree and shrub cover, Rocky Mountain junipers are observed making encroachments in the understory. After a longer period of time, the deciduous material dies or is overtopped by the juniper and a new juniper forest exists. The rate at which this succession proceeds is dependent upon site productivity and frequency of fires. Site productivity has a major impact on the variety of deciduous species that may colonize a site as well as the continuity of the pioneer woodland cover.

Representative stands of this intermediate phase included 20 feet tall elm and ash; 25 feet tall aspen; 8 feet tall chokecherry, buffaloberry, and juneberry; 2-3 feet tall snowberry; 4-6 feet tall dogwood and plum. Widely scattered Rocky Mountain juniper were evident in the stand as 6-8 feet tall specimens.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens and furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow tree/shrub rows interspersed with cropland at specified intervals. Field windbreaks oriented perpendicular to the prevailing winds are the most efficient. Intervals depend on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be properly planted on a well prepared site and maintained in good condition.

The following items should be considered before a planting is made: purpose of the planting, suitability of various species of trees and shrubs to the soils and climate, location and design of the windbreak, and selection of hardy seedlings. Planting stock should be from parent material originally from the Northern Great Plains or southern Canadian Prairie provinces. If these items are not considered, a poor, unsuccessful windbreak may result.

Establishment of a windbreak or an environmental planting and growth of trees and shrubs also depend on suitable site preparation and adequate maintenance after the trees and shrubs are planted. Grasses and weeds should be eliminated before the trees and shrubs are planted and competing ground cover should be controlled for the life of the windbreak. Competition from sod-forming grasses will greatly harm and sometimes kill tree and shrub plantings. Some replanting may be necessary during the first two years after the trees and shrubs are planted.

Windbreaks are often planted on land that did not originally support trees. Knowledge of how trees perform on such land can be gained only by observing and recording the performance of trees that have been planted and survived. Many popular windbreak species are not indigenous to the areas in which they are planted.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil.

Windbreak suitability groups consist of soils in which the kinds and degrees of hazards and limitations that affect the survival and growth of trees and shrubs in windbreaks are similar. They are a guide for selecting species best suited for different kinds of soils. Windbreak suitability groups are shown for each soil in the "Interpretive Groupings Report" table. They are given for drained conditions and, where applicable, undrained conditions.

The following paragraphs describe the windbreak suitability groups.

Group 1. These are very deep, well to somewhat poorly drained soils that receive beneficial moisture from favorable landscape positions, flooding, or runoff from adjacent land. They may also have a beneficial seasonally high water table during the spring. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs. Occasionally, somewhat poorly drained soils may have excessive water for some species.

Group 1K. These are very deep, calcareous, well to somewhat poorly drained soils on low rises near wetlands that receive beneficial moisture from favorable landscape positions or have a beneficial seasonally high water table during the spring. High calcium carbonate content will have an effect on the selection of species on soils in this group. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs. Occasionally, somewhat poorly drained soils may have excessive water for some species. Wind erosion is a concern on these soils.

Group 2. Soils in this group are very deep, poorly or very poorly drained, and excessively wet or ponded during the spring or overflow periods. Wetness and drainage will have an affect on the selection of tree and shrub species for soils in this group. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs. Spring planting may be delayed because of wet conditions. Wind erosion is a concern on the sandy and organic soils in this group.

Group 2H. Soils in this group are very deep, have an organic mat about 24 inches thick, are poorly or very poorly drained, and are excessively wet or ponded during the spring or overflow periods. Wetness and drainage will have an affect on the selection of tree and shrub species for soils in this group. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs. Spring planting may be delayed because of wet conditions. Wind erosion is a concern on these soils.

Group 2K. Soils in this group are very deep, calcareous, poorly or very poorly drained, and are on rims of potholes and broad flats that are excessively wet or ponded during the spring or overflow periods. Wetness, high calcium carbonate content, and drainage will have an affect on the selection of tree and shrub species for soils in this group. Competition from grass and weeds is the principal concern in

establishing and managing trees and shrubs. Spring planting may be delayed because of wet conditions. Wind erosion is a concern on these soils.

Group 3. Soils in this group are very deep, well drained, loamy textured soils with moderate and moderately slow saturated hydraulic conductivity on uplands. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs on these soils. Water erosion is a concern on the gently sloping to moderately steep areas.

Group 4. Soils in this group are moderately deep to very deep, have loamy surface textures with clayey subsoils, have slow or very slow saturated hydraulic conductivity and occur on uplands. High clay content has an affect on the selection of tree and shrub species for these soils. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs on these soils. Water erosion is a concern on the gently sloping to moderately steep areas.

Group 4C. Soils in this group are moderately deep to very deep, are clayey throughout, have slow or very slow saturated hydraulic conductivity, and occur on uplands. High clay content has an affect on the selection of tree and shrub species for these soils. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs on these soils. Wind erosion is a concern on these soils and water erosion is a concern on the gently sloping to moderately steep areas.

Group 5. Soils in this group are very deep with loamy and sandy textures. This group typically includes soils that normally have adequate soil moisture. Competition from grass and weeds and abrasion from wind erosion are the principal concerns in establishing and managing trees and shrubs on these soils.

Group 6D. Soils in this group are well drained, mostly loamy textured, and moderately deep over bedrock and other cemented layers that can severely restrict root growth. They have low or moderate available water capacity. Droughtiness will have an affect on the selection of tree and shrub species for use on these soils. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs on these soils. Water erosion is a concern on the gently sloping to moderately steep areas. Supplemental watering may be needed for establishment.

Group 6G. Soils in this group are well drained, mostly loamy textured, and moderately deep over sand and gravel. The sand and gravel can restrict root growth and reduce available water capacity. Droughtiness will have an affect on the selection of tree and shrub species for use on these soils. Competition from grass and weeds is the principal concern in establishing and managing trees and shrubs on these soils. Water erosion is a concern on the gently sloping to moderately steep areas. Supplemental watering may be needed for establishment.

Group 7. Soils in this group are very deep, excessively to moderately well drained, and sandy textured. They typically have low to very low available water capacity and do not normally have adequate moisture. Drought conditions and abrasion from wind erosion are the principal concerns in establishing and managing trees and shrubs on these soils. Specialized site preparation and planting methods (vegetation between the rows is normally left undisturbed) are needed to establish trees and shrubs. Supplemental watering may be essential for successful establishment.

Group 8. Soils in this group are calcareous at or near the surface. They do not receive beneficial moisture from run-on, flooding, or seasonal high water tables. High calcium carbonate content and competition from grass and weeds are the principal concerns in establishing and managing trees and shrubs on these soils. Wind erosion is a concern on these soils and water erosion is a concern on gently sloping to moderately steep areas.

Group 9C. Soils in this group are clayey and affected by salinity and/or sodicity. These soils do not have a seasonal high water table. Concentrations of salt will severely affect the establishment, vigor, and growth of trees and shrubs on these soils.

Group 9L. Soils in this group are loamy and affected by salinity and/or sodicity. These soils do not have a seasonal high water table. Concentrations of salt will severely affect the establishment, vigor, and growth of trees and shrubs on these soils.

Group 9W. Soils in this group are affected by salinity and/or sodicity and have a high water table. Concentrations of salt will severely affect the establishment, vigor, and growth of trees and shrubs on these soils.

Group 10. Soils in this group have one or more characteristics such as soil depth, texture, drainage, channeled phases, available water capacity, slope, or salt toxicity which severely limit planting, survival, or growth of trees and shrubs. Soils in this group are usually not recommended for farmstead and feedlot windbreaks, field windbreaks, and plantings for recreation and wildlife. However, on-site investigations may reveal tree and shrub plantings can be made with special treatments (hand planting, no till planting, scalp planting, specialized site preparation, drainage, or other specialized treatments). Selection of species must be tailored to soil conditions existing at each site.

All soils on moderately steep, steep, or very steep slopes (generally 15 percent or greater) and soils that are generally too wet, too shallow, or have other severely restrictive conditions fall into group 10. When an on-site investigation reveals a planting can be made on a soil in group 10, species should be selected from the most comparable windbreak suitability group. For example, for a shallow soil over bedrock, trees or shrubs would be selected from group 6D; an excessively wet soil would most closely match group 2.

More detailed information is available in Section II of the electronic Field Office Technical Guide (eFOTG) at www.nrcs.usda.gov/technical/efotg.

Potential Cropland Limitations and Hazards

(See text for a description and criteria of the limitations and hazards listed in this table.)

Map symbol and component name	Cropland limitations and hazards
2:	
Heil	High sodium content High water table Pesticide and nutrient leaching Pesticide and nutrient runoff Ponding Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting Wind erosion
3:	
Dimmick	Excessive saturated hydraulic conductivity High water table Pesticide and nutrient leaching Pesticide and nutrient runoff Ponding Poor tilth and compaction Restricted saturated hydraulic conductivity Wind erosion
5:	
Tonka	High water table Pesticide and nutrient leaching Pesticide and nutrient runoff Ponding Restricted saturated hydraulic conductivity
Hamerly	Alkalinity High water table Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
7:	
Harriet	Alkalinity High sodium content High water table Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting
9:	
Grano	Excessive saturated hydraulic conductivity High water table Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Ponding Poor tilth and compaction Restricted saturated hydraulic conductivity

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
10:	
Banks	Excessive saturated hydraulic conductivity Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
10D:	
Seroco	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
Lohler	Alkalinity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Wind erosion
11B:	
Patent	Alkalinity Lime content Pesticide and nutrient runoff Surface crusting Wind erosion
12:	
Trembles	Alkalinity Excessive saturated hydraulic conductivity Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
13:	
Havrelon	Alkalinity Lime content Limited organic matter Pesticide and nutrient runoff Surface crusting Wind erosion
14:	
Korchea	Channels Flooding Lime content Pesticide and nutrient runoff Surface crusting Wind erosion
15:	
Korchea	Lime content Pesticide and nutrient runoff Surface crusting Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
16:	
Ridgelawn	Alkalinity Excessive saturated hydraulic conductivity Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
17:	
Lohler	Alkalinity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Wind erosion
19:	
Hoffmanville	Alkalinity Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Wind erosion
20:	
Scorio	Alkalinity Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Wind erosion
21B:	
Tally	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion
Parshall	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion
21C:	
Tally	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Wind erosion
Parshall	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
22:	
Velva	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Wind erosion
23B:	
Lihen	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Wind erosion
Parshall	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion
23D:	
Beisigl	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Telfer	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
24:	
Arnegard	None
25:	
Farnuf	None
25B:	
Farnuf	Pesticide and nutrient runoff
25C:	
Farnuf	Pesticide and nutrient runoff Slope Water erosion
26:	
Tansem	Pesticide and nutrient runoff
Roseglen	Pesticide and nutrient runoff
26B:	
Tansem	Pesticide and nutrient runoff
Roseglen	Pesticide and nutrient runoff
27:	
Golva	None

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
27B:	
Golva	Pesticide and nutrient runoff
27C:	
Golva	Pesticide and nutrient runoff Slope Water erosion
29:	
Savage	Poor tilth and compaction Restricted saturated hydraulic conductivity
29B:	
Savage	Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity
29C:	
Savage	Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Slope Water erosion
30:	
Lawther	Alkalinity Limited available water capacity Poor tilth and compaction Restricted saturated hydraulic conductivity Wind erosion
31B:	
Cherry	Lime content Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Surface crusting Water erosion Wind erosion
31C:	
Cherry	Lime content Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
32F:	
Cherry	Lime content Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
32F:(cont.)	
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
33:	
Belfield	High sodium content
	Pesticide and nutrient leaching
	Restricted saturated hydraulic conductivity
	Salt content
Grail	Pesticide and nutrient leaching
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
33B:	
Belfield	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Root limiting
	Water erosion
Savage	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
34B:	
Daglum	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
Belfield	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Root limiting
36B:	
Rhoades	Alkalinity
	High sodium content
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
Daglum	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
38B:	
Dogtooth	Alkalinity Depth to rock High sodium content Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting
Janesburg	Depth to rock High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting
38F:	
Dogtooth	Alkalinity Depth to rock High sodium content Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Surface crusting Water erosion
Janesburg	Depth to rock High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Surface crusting Water erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
40B:	
Desart	Excessive saturated hydraulic conductivity High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Wind erosion
Janesburg	Depth to rock High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting
Ekalaka	Excessive saturated hydraulic conductivity High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Salt content Wind erosion
41:	
Williams	Pesticide and nutrient runoff
Bowbells	Pesticide and nutrient leaching Pesticide and nutrient runoff
41B:	
Williams	Pesticide and nutrient runoff
Bowbells	Pesticide and nutrient leaching Pesticide and nutrient runoff
42B:	
Williams	Pesticide and nutrient runoff
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Surface crusting Wind erosion
42C:	
Williams	Pesticide and nutrient runoff Slope Water erosion
43C:	
Williams	Pesticide and nutrient runoff Slope Water erosion
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
44D:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Williams	Pesticide and nutrient runoff Slope Water erosion
44E:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Williams	Pesticide and nutrient runoff Slope Water erosion
45F:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Maschetah	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
46B:	
Dooley	Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
46B:(cont.)	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Surface crusting Wind erosion
46C:	
Dooley	Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
46D:	
Dooley	Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
48:	
Temvik	Pesticide and nutrient runoff
Wilton	Pesticide and nutrient runoff
49:	
Temvik	Pesticide and nutrient runoff
Williams	Pesticide and nutrient runoff
49B:	
Temvik	Pesticide and nutrient runoff
Williams	Pesticide and nutrient runoff
50B:	
Temvik	Pesticide and nutrient runoff
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Surface crusting Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
51B:	
Amor	Depth to rock
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
Shambo	Pesticide and nutrient runoff
51C:	
Amor	Depth to rock
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
51D:	
Amor	Depth to rock
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
52B:	
Reeder	Depth to rock
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
Farnuf	Pesticide and nutrient runoff
52C:	
Reeder	Depth to rock
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
52C:(cont.)	
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
53B:	
Chama	Alkalinity Depth to rock Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Surface crusting Wind erosion
Sen	Depth to rock Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Surface crusting Wind erosion
53C:	
Chama	Alkalinity Depth to rock Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
53C:(cont.)	
Sen	Depth to rock Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion
53D:	
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Chama	Alkalinity Depth to rock Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Sen	Depth to rock Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion
54F:	
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Sen	Depth to rock Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
54F:(cont.)	
Chama	Alkalinity Depth to rock Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
55B:	
Sen	Depth to rock Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity
Janesburg	Depth to rock High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting
56B:	
Lefor	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Wind erosion
56C:	
Lefor	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Wind erosion
61D:	
Beisigl	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
61D:(cont.)	
Flasher	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
61F:	
Beisigl	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Flasher	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Tally	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
62F:	
Flasher	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Areas of rock outcrop Slope Water erosion Wind erosion
Rock outcrop	Onsite required

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
62F:(cont.)	
Vebar	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Areas of rock outcrop Slope Water erosion Wind erosion
63B:	
Vebar	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Wind erosion
Flasher	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Wind erosion
63C:	
Vebar	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Wind erosion
Flasher	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Wind erosion
63D:	
Vebar	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
63D:(cont.)	
Flasher	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Tally	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
66B:	
Manning	Depth to sand and gravel Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion
70B:	
Regent	Depth to rock Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity
Savage	Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity
70C:	
Regent	Depth to rock Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Slope Water erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
71B:	
Regent	Depth to rock
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
Janesburg	Depth to rock
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
71C:	
Regent	Depth to rock
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion
Janesburg	Depth to rock
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
72B:	
Moreau	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Wind erosion
72C:	
Moreau	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Water erosion
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
72C:(cont.)	
Wayden	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Water erosion
	Wind erosion
72D:	
Moreau	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Water erosion
	Wind erosion
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
80:	
Badland	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
83F:	
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Badland, outcrop	Alkalinity Depth to rock High sodium content Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Soil slumping Water erosion Wind erosion
84F:	
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Chama	Alkalinity Depth to rock Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Havrelon	Alkalinity Lime content Limited organic matter Pesticide and nutrient runoff Surface crusting Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
88D:	
Brandenburg	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
Searing	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion
Dogtooth	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
88F:	
Brandenburg	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
88F:(cont.)	
Dogtooth	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
89F:	
Brandenburg	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Surface rock fragments
	Water erosion
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
Badland, outcrop	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
90E:	
Manning	Depth to sand and gravel
	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
90E:(cont.)	
Schaller	Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
Wabek	Alkalinity Depth to sand and gravel Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Surface crusting Water erosion
91F:	
Wabek	Alkalinity Depth to sand and gravel Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Surface crusting Water erosion
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
93B:	
Lehr	Depth to sand and gravel Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff
Stady	Depth to sand and gravel Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff
94B:	
Searing	Depth to sand and gravel Depth to scoria Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff
Ringling	Depth to sand and gravel Depth to scoria Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
95:	
Havrelon	Alkalinity
	Lime content
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Wind erosion
96:	
Pits, gravel and sand	Alkalinity
	Depth to sand and gravel
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface rock fragments
	Water erosion
98F:	
Tinsley	Depth to sand and gravel
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Surface rock fragments
	Water erosion
	Wind erosion
Chanta	Depth to sand and gravel
	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion
99:	
Mckeen	Excessive saturated hydraulic conductivity
	Flooding
	High water table
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Surface crusting
	Wind erosion
100F:	
Boxwell	Depth to rock
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
100F:(cont)	
Cabbart	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion
101F:	
Cabbart	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Badland, outcrop	Alkalinity Depth to rock High sodium content Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Soil slumping Water erosion Wind erosion
102B:	
Kremlin	Pesticide and nutrient runoff Water erosion
Ethridge	Lime content Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Water erosion
Gerda	Alkalinity Excessive saturated hydraulic conductivity High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
103B:	
Chinook	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion
Rhame	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Wind erosion
103D:	
Rhame	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Chinook	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
103F:	
Rhame	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Fleak	Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
104E:	
Badland, outcrop	Alkalinity Depth to rock High sodium content Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Soil slumping Water erosion Wind erosion
Patent	Alkalinity High sodium content Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
105:	
Havre	Alkalinity Lime content Limited organic matter Pesticide and nutrient runoff Surface crusting Wind erosion
106:	
Glendive	Alkalinity Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
107:	
Kremlin	Pesticide and nutrient runoff
108B:	
Hanly	Alkalinity Excessive saturated hydraulic conductivity Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion
109:	
Havre	Alkalinity Lime content Limited organic matter Pesticide and nutrient runoff Surface crusting Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
110B:	
Maltese	Excessive saturated hydraulic conductivity
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
Gerda	Alkalinity
	Excessive saturated hydraulic conductivity
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
111D:	
Gerda	Alkalinity
	Excessive saturated hydraulic conductivity
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
Kirby	Alkalinity
	Dense layer
	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Surface rock fragments
111F:	
Kirby	Alkalinity
	Dense layer
	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Surface rock fragments
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
111F:(cont.)	
Scairt	Alkalinity
	Depth to rock
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
112F:	
Kirby	Alkalinity
	Dense layer
	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Surface rock fragments
	Water erosion
Badland, outcrop	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
Patent	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
	Wind erosion
113F:	
Lonna	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
113F:(cont.)	
Cabbart	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
114:	
Channel	Onsite required
Glendive	Alkalinity Channels Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
Havre	Alkalinity Channels Lime content Limited organic matter Pesticide and nutrient runoff Surface crusting Wind erosion
115F:	
Badland, outcrop	Alkalinity Depth to rock High sodium content Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Soil slumping Water erosion Wind erosion
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
115F:(cont.)	
Cabbart	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
116F:	
Kremlin	Pesticide and nutrient runoff Slope Soil slumping Water erosion
Cabbart	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Soil slumping Surface crusting Water erosion Wind erosion
117:	
Wolf Point	Lime content Limited organic matter Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Surface crusting
118F:	
Lonna	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Kirby	Alkalinity Dense layer Depth to sand and gravel Depth to scoria Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Surface crusting Surface rock fragments Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
118F:(cont.)	
Cabbart	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
119F:	
Patent	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Badland, outcrop	Alkalinity Depth to rock High sodium content Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Soil slumping Water erosion Wind erosion
Cabbart	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
121F:	
Maltese	Excessive saturated hydraulic conductivity High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Surface crusting Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
121F:(cont.)	
Lonna	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion
127:	
Maschetah	Alkalinity Lime content Surface crusting Wind erosion
127B:	
Maschetah	Alkalinity Lime content Pesticide and nutrient runoff Surface crusting Wind erosion
127C:	
Maschetah	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
131B:	
Lonna	Alkalinity Lime content Pesticide and nutrient runoff Surface crusting Water erosion Wind erosion
131C:	
Lonna	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
132C:	
Patent	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
132C:(cont.)	
Gerda	Alkalinity
	Excessive saturated hydraulic conductivity
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
Slickspots	Alkalinity
	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Root limiting
	Salt content
	Surface crusting
	Wind erosion
138E:	
Scairt	Alkalinity
	Depth to rock
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
Maltese	Excessive saturated hydraulic conductivity
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
Boxwell	Depth to rock
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
145F:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion
146B:	
Dooley	Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Wind erosion
151B:	
Boxwell	Depth to rock Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Water erosion
Kremlin	Pesticide and nutrient runoff Water erosion
151D:	
Boxwell	Depth to rock Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion
Kremlin	Pesticide and nutrient runoff Slope Water erosion
154F:	
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
154F:(cont.)	
Shambo	Pesticide and nutrient runoff
	Slope
	Water erosion
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
161F:	
Beisigl	Alkalinity
	Depth to rock
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion
	Wind erosion
Flasher	Alkalinity
	Depth to rock
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion
	Wind erosion
Arikara	Excessive saturated hydraulic conductivity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion
164D:	
Vebar	Depth to rock
	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface stones
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
171:	
Lohler	Alkalinity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Wind erosion
180:	
Badland	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
183F:	
Badland, outcrop	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
Cabba	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
187F:	
Arikara	Excessive saturated hydraulic conductivity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
187F:(cont.)	
Cabbart	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
193B:	
Chanta	Depth to sand and gravel
	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
194F:	
Kirby	Alkalinity
	Dense layer
	Depth to sand and gravel
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Surface rock fragments
	Water erosion
Arikara	Excessive saturated hydraulic conductivity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion
Badland, outcrop	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
195:	
Havrelon	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Salt content
	Surface crusting
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
199:	
Mckeen	Excessive saturated hydraulic conductivity
	Flooding
	High water table
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Ponding
	Restricted saturated hydraulic conductivity
	Surface crusting
	Wind erosion
201F:	
Badland, outcrop	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
Cabbart	Alkalinity
	Depth to rock
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Surface crusting
	Water erosion
	Wind erosion
202D:	
Boxwell	Depth to rock
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion
Scairt	Alkalinity
	Depth to rock
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
202D:(cont.)	
Maltese	Excessive saturated hydraulic conductivity High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Surface crusting Water erosion
203D:	
Rhame	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Kremlin	Pesticide and nutrient runoff Slope Water erosion
Maltese	Excessive saturated hydraulic conductivity High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Surface crusting Water erosion
203F:	
Rhame	Depth to rock Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Scairt	Alkalinity Depth to rock High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Surface crusting Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
203F:(cont.)	
Kremlin	Pesticide and nutrient runoff Slope Water erosion
205:	
Havre	Alkalinity Lime content Limited organic matter Pesticide and nutrient runoff Surface crusting Wind erosion
206:	
Glendive	Alkalinity Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
207:	
Harriet	Alkalinity Flooding High sodium content High water table Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Surface crusting
211F:	
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Badland, outcrop	Alkalinity Depth to rock High sodium content Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Soil slumping Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
211F:(cont.)	
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion
212:	
Trembles	Alkalinity Excessive saturated hydraulic conductivity Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
213:	
Havrelon	Alkalinity Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion
214:	
Channel	Onsite required
Korchea	Channels Flooding Lime content Pesticide and nutrient runoff Surface crusting Wind erosion
217:	
Wolf Point	Lime content Limited organic matter Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Surface crusting
218F:	
Cherry	Lime content Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
218F:(cont.)	
Brandenburg	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
227:	
Haydraw	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Surface crusting
	Wind erosion
227B:	
Haydraw	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Surface crusting
	Wind erosion
231C:	
Patent	Alkalinity
	Gullies
	Lime content
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
	Wind erosion
Gullied land	Alkalinity
	Depth to rock
	Excessive saturated hydraulic conductivity
	Gullies
	High sodium content
	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
Glendive	Alkalinity
	Excessive saturated hydraulic conductivity
	Gullies
	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Surface crusting
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
232C:	
Lambert	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
	Wind erosion
Slickspots	Alkalinity
	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Root limiting
	Salt content
	Surface crusting
Rhoades	Alkalinity
	High sodium content
	Lime content
	Limited available water capacity
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
238B:	
Janesburg	Depth to rock
	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
Dogtooth	Alkalinity
	Depth to rock
	High sodium content
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
239D:	
Vebar	Depth to rock
	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
239D:(cont.)	
Janesburg	Depth to rock Excessive saturated hydraulic conductivity High sodium content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Surface crusting Water erosion Wind erosion
242F:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Williams	Pesticide and nutrient runoff Slope Water erosion
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion
287F:	
Arikara	Excessive saturated hydraulic conductivity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
299:	
Minnewaukan	Excessive saturated hydraulic conductivity Flooding High water table Lime content Pesticide and nutrient leaching Pesticide and nutrient runoff Ponding Surface crusting Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
299:(cont.)	
Banks	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Wind erosion
Riverwash	Excessive saturated hydraulic conductivity
	Flooding
	High water table
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Wind erosion
317:	
Lallie	Alkalinity
	Flooding
	High water table
	Lime content
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Ponding
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
331B:	
Cherry	Gullies
	Lime content
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Surface crusting
	Water erosion
	Wind erosion
Gullied land	Alkalinity
	Depth to rock
	Excessive saturated hydraulic conductivity
	Gullies
	High sodium content
	Lime content
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Salt content
	Slope
	Soil slumping
	Water erosion
	Wind erosion
Havrelon	Alkalinity
	Gullies
	Lime content
	Limited organic matter
	Pesticide and nutrient runoff
	Surface crusting
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
340B:	
Niobell	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Root limiting
Williams	Pesticide and nutrient runoff
341B:	
Noonan	High sodium content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Surface crusting
Niobell	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Root limiting
Williams	Pesticide and nutrient runoff
341C:	
Noonan	High sodium content
	Limited available water capacity
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Restricted saturated hydraulic conductivity
	Salt content
	Slope
	Surface crusting
	Water erosion
Williams	Pesticide and nutrient runoff
	Slope
	Water erosion
403F:	
Rhame	Depth to rock
	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Restricted saturated hydraulic conductivity
	Slope
	Water erosion
	Wind erosion
Arikara	Excessive saturated hydraulic conductivity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
403F:(cont.)	
Fleak	Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
404F:	
Badland, outcrop	Alkalinity Depth to rock High sodium content Lime content Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Restricted saturated hydraulic conductivity Salt content Slope Soil slumping Water erosion Wind erosion
Lambert	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
406:	
Glendive	Alkalinity Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Surface crusting Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
408B:	
Hanly	Alkalinity
	Excessive saturated hydraulic conductivity
	Limited available water capacity
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Wind erosion
410:	
Riverwash	Excessive saturated hydraulic conductivity
	Flooding
	High water table
	Limited organic matter
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Poor tilth and compaction
	Wind erosion
411B:	
Lambert	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Water erosion
	Wind erosion
412E:	
Lambert	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Water erosion
	Wind erosion
Brandenburg	Depth to sand and gravel
	Depth to scoria
	Excessive saturated hydraulic conductivity
	Lime content
	Limited available water capacity
	Pesticide and nutrient leaching
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
442F:	
Zahl	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
	Wind erosion
Williams	Pesticide and nutrient runoff
	Slope
	Water erosion
460C:	
Zahl	Alkalinity
	Lime content
	Pesticide and nutrient runoff
	Slope
	Surface crusting
	Water erosion
	Wind erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
460C:(cont.)	
Williams	Pesticide and nutrient runoff Slope Water erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
460D:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Cabba	Alkalinity Depth to rock Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Surface crusting Water erosion Wind erosion
Williams	Pesticide and nutrient runoff Slope Water erosion
470C:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Tally	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Wind erosion
Williams	Pesticide and nutrient runoff Slope Water erosion

Potential Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
470D:	
Zahl	Alkalinity Lime content Pesticide and nutrient runoff Slope Surface crusting Water erosion Wind erosion
Beisigl	Alkalinity Depth to rock Excessive saturated hydraulic conductivity Lime content Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Restricted saturated hydraulic conductivity Slope Water erosion Wind erosion
Tally	Excessive saturated hydraulic conductivity Limited available water capacity Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Water erosion Wind erosion
490:	
Riverwash	Excessive saturated hydraulic conductivity Flooding High water table Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Poor tilth and compaction Wind erosion
496:	
Pits, gravel and sand	Alkalinity Depth to sand and gravel Excessive saturated hydraulic conductivity Lime content Limited available water capacity Limited organic matter Pesticide and nutrient leaching Pesticide and nutrient runoff Slope Surface rock fragments Water erosion
M-W:	
Miscellaneous water	Onsite required
W:	
Water	Onsite required

Map Unit Productivity Index and Farmland Designation

(Productivity indexes in ( ) are for drained phases.)

Map symbol	Spring wheat productivity index	Farmland designation
2	30	Other land
3	30	Other land
5	51 (74)	Prime farmland if drained
7	26	Other land
9	25	Other land
10	47	Other land
10D	18	Other land
11B	49	Other land
12	64	Farmland of statewide importance
13	76	Farmland of statewide importance
14	44	Other land
15	84	Farmland of statewide importance
16	61	Farmland of statewide importance
17	79	Farmland of statewide importance
19	70	Farmland of statewide importance
20	74	Farmland of statewide importance
21B	66	Farmland of statewide importance
21C	50	Other land
22	64	Farmland of statewide importance
23B	50	Farmland of statewide importance
23D	28	Other land
24	94	Prime farmland
25	88	Farmland of statewide importance
25B	83	Farmland of statewide importance
25C	67	Farmland of statewide importance
26	88	Farmland of statewide importance
26B	79	Farmland of statewide importance
27	84	Farmland of statewide importance
27B	82	Farmland of statewide importance
27C	59	Farmland of statewide importance
29	89	Farmland of statewide importance
29B	84	Farmland of statewide importance

Map Unit Productivity Index and Farmland Designation--Continued

Map symbol	Spring wheat productivity index	Farmland designation
29C	69	Farmland of statewide importance
30	79	Farmland of statewide importance
31B	75	Farmland of statewide importance
31C	56	Farmland of statewide importance
32F	29	Other land
33	83	Farmland of statewide importance
33B	77	Farmland of statewide importance
34B	56	Other land
36B	38	Other land
38B	32	Other land
38F	21	Other land
40B	51	Other land
41	92	Farmland of statewide importance
41B	86	Farmland of statewide importance
42B	76	Other land
42C	72	Farmland of statewide importance
43C	60	Other land
44D	45	Other land
44E	37	Other land
45F	37	Other land
46B	66	Other land
46C	52	Other land
46D	41	Other land
48	90	Farmland of statewide importance
49	88	Farmland of statewide importance
49B	82	Farmland of statewide importance
50B	76	Other land
51B	76	Farmland of statewide importance
51C	53	Other land
51D	41	Other land
52B	79	Farmland of statewide importance
52C	64	Other land
53B	66	Farmland of statewide importance

Map Unit Productivity Index and Farmland Designation--Continued

Map symbol	Spring wheat productivity index	Farmland designation
53C	49	Other land
53D	37	Other land
54F	25	Other land
55B	61	Other land
56B	58	Farmland of statewide importance
56C	45	Other land
61D	26	Other land
61F	22	Other land
62F	13	Other land
63B	54	Other land
63C	44	Other land
63D	33	Other land
66B	46	Other land
70B	77	Farmland of statewide importance
70C	56	Farmland of statewide importance
71B	64	Other land
71C	52	Other land
72B	65	Other land
72C	47	Other land
72D	39	Other land
80	3	Other land
83F	13	Other land
84F	41	Other land
88D	33	Other land
88F	20	Other land
89F	12	Other land
90E	30	Other land
91F	22	Other land
93B	52	Other land
94B	59	Farmland of statewide importance
95	80	Framland of statewide importance
96	9	Other land
98F	22	Other land

Map Unit Productivity Index and Farmland Designation--Continued

Map symbol	Spring wheat productivity index	Farmland designation
99	23	Other land
100F	24	Other land
101F	17	Other land
102B	65	Other land
103B	65	Farmland of statewide importance
103D	43	Other land
103F	19	Other land
104E	14	Other land
105	80	Farmland of statewide importance
106	61	Farmland of statewide importance
107	81	Farmland of statewide importance
108B	47	Other land
109	79	Farmland of statewide importance
110B	46	Other land
111D	32	Other land
111F	19	Other land
112F	13	Other land
113F	36	Other land
114	36	Other land
115F	17	Other land
116F	28	Other land
117	81	Farmland of statewide importance
118F	28	Other land
119F	22	Other land
121F	28	Other land
127	85	Farmland of statewide importance
127B	79	Farmland of statewide importance
127C	60	Farmland of statewide importance
131B	72	Farmland of statewide importance
131C	58	Farmland of statewide importance
132C	39	Other land
138E	29	Other land
145F	29	Other land

Map Unit Productivity Index and Farmland Designation--Continued

Map symbol	Spring wheat productivity index	Farmland designation
146B	69	Farmland of statewide importance
151B	77	Farmland of statewide importance
151D	54	Other land
154F	25	Other land
161F	14	Other land
164D	15	Other land
171	41	Other land
180	5	Other land
183F	10	Other land
187F	18	Other land
193B	61	Farmland of statewide importance
194F	13	Other land
195	50	Other land
199	4	Other land
201F	8	Other land
202D	41	Other land
203D	50	Other land
203F	20	Other land
205	79	Farmland of statewide importance
206	61	Farmland of statewide importance
207	24	Other land
211F	12	Other land
212	66	Farmland of statewide importance
213	84	Farmland of statewide importance
214	44	Other land
217	80	Farmland of statewide importance
218F	31	Other land
227	84	Farmland of statewide importance
227B	80	Farmland of statewide importance
231C	44	Other land
232C	37	Other land
238B	43	Other land
239D	41	Other land

Map Unit Productivity Index and Farmland Designation--Continued

Map symbol	Spring wheat productivity index	Farmland designation
242F	30	Other land
287F	18	Other land
299	22	Other land
317	31	Other land
331B	56	Other land
340B	78	Farmland of statewide importance
341B	63	Other land
341C	54	Other land
403F	20	Other land
404F	18	Other land
406	61	Farmland of statewide importance
408B	47	Other land
410	9	Other land
411B	54	Other land
412E	38	Other land
442F	33	Other land
460C	53	Other land
460D	37	Other land
470C	50	Other land
470D	33	Other land
490	8	Other land
496	9	Other land
M-W	0	Other land
W	0	Other land

Yields per Acre of Crops

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. Entries in () are for drained conditions.)

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
2: Heil	11	18	24	550	1.1
3: Dimmick	11	18	24	550	0.5
5: Tonka Hamerly	19 (27)	31 (44)	40 (58)	900 (1350)	2.1 (2.0)
7: Harriet	10	16	20	500	1.1
9: Grano	9	15	20	500	0.5
10: Banks	17	28	37	900	1.4
10D: Seroco Lohler	7	11	14	300	1.3
11B: Patent	18	29	39	900	1.4
12: Trembles	24	38	50	1,200	2.4
13: Havrelon	28	46	60	1,400	1.8
14: Korchea	16	26	35	800	2.4
15: Korchea	34	56	73	1,700	2.2
16: Ridgelawn	23	37	48	1,100	2.4
17: Lohler	32	53	69	1,620	2.1
19: Hoffmanville	26	42	55	1,300	2.4
20: Scorio	27	44	58	1,400	2.4
21B: Tally Parshall	24	40	52	1,050	1.4
21C: Tally Parshall	18	29	39	800	1.4

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
22: Velva	24	38	50	1,000	1.6
23B: Lihen Parshall	19	30	39	950	1.4
23D: Beisigl Telfer	10	17	22	500	1.1
24: Arnegard	35	57	74	1,750	1.8
25: Farnuf	36	59	77	1,800	2.3
25B: Farnuf	31	50	65	1,550	1.8
25C: Farnuf	25	40	53	1,200	1.8
26: Tansem Roseglen	33	53	69	1,600	2.0
26B: Tansem Roseglen	29	47	62	1,500	2.0
27: Golva	31	51	66	1,600	1.8
27B: Golva	30	49	64	1,500	1.8
27C: Golva	22	35	46	1,100	1.8
29: Savage	33	54	70	1,650	1.6
29B: Savage	31	51	66	1,550	1.6
29C: Savage	26	41	54	1,100	1.6
30: Lawther	29	47	62	1,250	1.6
31B: Cherry	31	50	65	1,540	2.0
31C: Cherry	23	37	49	1,150	1.5
32F: Cherry Cabba	9	15	19	450	---

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
33: Belfield Grail	31	50	65	1,550	1.7
33B: Belfield Savage	28	46	61	1,400	1.4
34B: Daglum Belfield	21	34	44	1,000	1.2
36B: Rhoades Daglum	14	23	30	700	0.9
38B: Dogtooth Janesburg	12	19	25	600	0.9
38F: Dogtooth Janesburg Cabba	8	13	17	400	0.4
40B: Desart Janesburg Ekalaka	19	31	40	900	1.2
41: Williams Bowbells	34	55	72	1,450	2.0
41B: Williams Bowbells	32	52	68	1,400	2.0
42B: Williams Zahl	28	46	60	1,400	1.5
42C: Williams	27	43	57	1,300	1.8
43C: Williams Zahl	22	37	48	1,000	1.5
44D: Zahl Williams	17	27	35	850	1.0
44E: Zahl Williams	14	22	29	700	0.7
45F: Zahl Cabba Maschetah	14	22	29	700	0.5

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
46B: Dooley Zahl	24	39	51	1,200	1.5
46C: Dooley Zahl	19	31	41	1,000	1.5
46D: Dooley Zahl	15	25	32	800	1.2
48: Temvik Wilton	33	54	71	1,650	2.0
49: Temvik Williams	33	53	69	1,600	1.8
49B: Temvik Williams	30	49	64	1,300	2.0
50B: Temvik Zahl	28	46	60	1,400	1.5
51B: Amor Shambo	28	46	60	1,400	1.8
51C: Amor Cabba	20	32	42	1,000	1.0
51D: Amor Cabba	15	25	32	750	0.8
52B: Reeder Farnuf	29	47	62	1,250	1.6
52C: Reeder Cabba	24	38	50	1,200	1.0
53B: Chama Sen Cabba	24	40	52	1,200	1.2
53C: Chama Cabba Sen	18	29	39	900	1.1
53D: Cabba Chama Sen	14	22	29	700	0.7

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
54F: Cabba Sen Chama	9	15	20	450	0.3
55B: Sen Janesburg	23	37	48	1,150	1.3
56B: Lefor	21	35	46	1,050	1.3
56C: Lefor	17	27	35	800	1.3
61D: Beisigl Flasher	10	16	20	400	0.7
61F: Beisigl Flasher Tally	8	13	17	400	0.5
62F: Flasher Rock outcrop Vebar	5	8	10	250	0.1
63B: Vebar Flasher	20	32	42	1,000	1.0
63C: Vebar Flasher	17	27	35	850	1.0
63D: Vebar Flasher Tally	12	20	26	600	0.8
66B: Manning	17	28	36	850	1.4
70B: Regent Savage	28	46	61	1,450	1.4
70C: Regent Cabba	21	34	44	1,000	1.0
71B: Regent Janesburg	24	38	50	1,000	1.3
71C: Regent Janesburg	19	31	41	850	1.3
72B: Moreau	24	39	51	1,200	1.6

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
72C: Moreau Wayden	17	28	37	750	1.2
72D: Moreau Cabba	14	23	31	700	0.8
80: Badland, high Precipitation					
83F: Cabba Badland, outcrop	5	9	11	270	0.3
84F: Cabba Chama Havrelon	15	25	32	800	0.7
88D: Brandenburg Searing Dogtooth	12	20	26	600	0.9
88F: Brandenburg Cabba Dogtooth	7	12	16	400	0.2
89F: Brandenburg Cabba Badland, outcrop	4	7	9	200	0.1
90E: Manning Schaller Wabek	11	18	24	550	0.7
91F: Wabek Zahl	8	13	17	400	0.4
93B: Lehr Stady	20	32	42	850	1.6
94B: Searing Ringling	22	35	46	1,100	1.4
95: Havrelon	30	48	63	1,500	2.4
96: Pits, gravel and sand					
98F: Tinsley Chanta	8	13	17	400	0.6

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
99: Mckeen	9	14	14	450	0.6
100F: Boxwell Cabbart Arikara	9	14	19	450	0.3
101F: Cabbart Badland, outcrop	6	10	13	300	0.1
102B: Kremlin Ethridge Gerda	24	39	51	1,200	1.3
103B: Chinook Rhame	24	39	51	1,200	1.0
103D: Rhame Chinook	16	26	34	800	0.7
103F: Rhame Fleak	7	11	15	350	0.2
104E: Badland, outcrop Patent	5	8	11	250	0.4
105: Havre	30	48	63	1,500	1.4
106: Glendive	23	37	48	1,150	1.1
107: Kremlin	30	49	64	1,500	1.4
108B: Hanly	17	28	37	850	1.3
109: Havre, wooded	29	47	62	1,450	1.4
110B: Maltese Gerda	17	28	36	850	0.8
111D: Gerda Kirby	12	19	25	600	0.6
111F: Kirby Scairt	7	11	15	400	0.2

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
112F: Kirby Badland, outcrop Patent	5	8	10	250	0.2
113F: Lonna Cabbart	13	22	28	650	0.5
114: Channel Glendive Havre	13	21	28	650	1.3
115F: Badland, outcrop Arikara Cabbart	6	10	13	300	0.1
116F: Kremlin Cabbart	10	17	22	500	0.7
117: Wolf Point	30	49	64	1,500	1.5
118F: Lonna Kirby Cabbart	10	16	21	500	0.6
119F: Patent Badland, outcrop Cabbart	8	13	17	400	0.6
121F: Maltese Lonna Arikara	10	17	22	500	1.0
127: Maschetah	31	51	67	1,600	1.4
127B: Maschetah	29	47	62	1,500	1.4
127C: Maschetah	21	34	45	1,050	---
131B: Lonna	27	43	57	1,350	1.4
131C: Lonna	21	35	46	1,050	1.4
132C: Patent Gerda Slickspots	14	23	31	700	0.9

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
138E: Scairt Maltese Boxwell	11	17	23	550	0.7
145F: Zahl Cabba Arikara	9	15	20	500	0.4
146B: Dooley	20	33	43	1,300	1.8
151B: Boxwell Kremlin	28	46	61	1,450	1.5
151D: Boxwell Kremlin	20	32	42	1,000	1.0
154F: Arikara Shambo Cabba	9	15	20	450	0.4
161F: Beisigl Flasher Arikara	4	6	8	200	0.3
164D: Vebar, extremely stony	6	9	12	300	0.3
171: Lohler, moderately Saline	17	27	36	840	1.4
180: Badland					
183F: Badland, outcrop Cabba	4	6	8	200	0.1
187F: Arikara Cabbart	2	4	5	100	0.3
193B: Chanta	23	37	48	1,100	1.3
194F: Kirby Arikara Badland, outcrop	5	8	10	250	0.2
195: Havrelon	19	30	39	900	1.4
199: Mckeen	5	8	10	241	0.3

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
201F: Badland, outcrop Cabbart	3	5	6	150	0.1
202D: Boxwell Scairt Maltese	15	25	32	750	0.8
203D: Rhame Kremlin Maltese	19	30	39	950	1.1
203F: Rhame Scairt Kremlin	7	12	16	400	0.3
205: Havre, rarely flooded	29	47	62	1,450	1.4
206: Glendive, rarely flooded	23	37	48	1,150	1.1
207: Harriet	9	14	19	450	1.0
211F: Cabba Badland, outcrop Arikara	3	5	6	100	0.2
212: Trembles	27	44	58	1,350	1.8
213: Havrelon, slightly wet	31	51	66	1,350	1.8
214: Channel Korchea, wooded	16	26	35	800	2.4
217: Wolf Point, wooded	30	48	63	1,500	1.5
218F: Cherry Cabba Brandenburg	11	18	24	600	0.6
227: Haydraw	31	51	66	1,600	1.4
227B: Haydraw	30	48	63	1,500	1.4
231C: Patent Gullied land Glendive	16	26	35	800	0.8

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
232C: Lambert Slickspots Rhoades	14	22	29	700	1.0
238B: Janesburg Dogtooth	16	26	34	800	0.9
239D: Vebar Janesburg	15	25	32	800	1.4
242F: Zahl Williams Arikara	9	15	20	500	0.5
287F: Arikara Cabba	2	4	5	100	0.3
299: Minnewaukan Banks Riverwash	8	13	17	400	1.5
317: Lallie	11	19	24	600	1.5
331B: Cherry Gullied land Havrelon	21	34	44	1,000	1.4
340B: Niobell Williams	29	47	61	1,400	1.5
341B: Noonan Niobell Williams	23	38	50	1,200	1.3
341C: Noonan Williams	20	32	42	1,000	1.4
403F: Rhame Arikara Fleak	7	12	16	350	0.2
404F: Badland, outcrop Lambert Cabba	7	11	14	350	0.4
406: Glendive, wooded	23	37	48	1,150	1.1
408B: Hanly, wooded	17	28	37	850	1.3

Yields per Acre of Crops--Continued

Map symbol and soil name	Spring wheat	Barley	Oats	Sunflowers	Grass-legume hay
	Bu	Bu	Bu	Lbs	Tons
410: Riverwash					
411B: Lambert	20	32	42	1,000	1.8
412E: Lambert Brandenburg	14	23	30	700	1.2
442F: Zahl Williams	12	20	26	550	0.3
460C: Zahl Williams Cabba	20	32	42	1,000	1.4
460D: Zahl Cabba Williams	14	22	29	700	0.8
470C: Zahl Tally Williams	19	30	39	900	1.3
470D: Zahl Beisigl Tally	12	20	26	600	0.9
490: Riverwash, low precipitation					
496: Pits, gravel and sand, low precipitation					
M-W: Miscellaneous water					
W: Water					

Interpretive Groupings Report

(Dashes (--) indicate an interpretive group is not assigned. Entries in ( ) are for drained conditions.)

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
2:			
Heil	Not suited	6s	10
3:			
Dimmick	Not suited	5w (3w)	10 (2)
5:			
Tonka	Wet (Subirrigated)	4w (2w)	2 (1)
Hamerly	Subirrigated	2e	1K
7:			
Harriet	Not suited	6s	10
9:			
Grano	Wet	4w	2K
10:			
Banks	Sand	4e	7
10D:			
Seroco	Not suited	6e	10
Lohler	Overflow	2e	4C
11B:			
Patent	Limy Upland	4e	8
12:			
Trembles	Droughty Loam	3e	5
13:			
Havrelon	Loam	2e	1K
14:			
Korchea	Overflow	6w	10
15:			
Korchea	Loam	2e	1K
16:			
Ridgelawn	Loam	2e	6G
17:			
Lohler	Overflow	2e	4C
19:			
Hoffmanville	Overflow	2e	4C
20:			
Scorio	Overflow	2e	4C
21B:			
Tally	Droughty Loam	3e	5
Parshall	Loam	3e	5
21C:			
Tally	Droughty Loam	4e	5
Parshall	Loam	4e	5

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
22:			
Velva	Loam	3e	5
23B:			
Lihen	Sand	4e	7
Parshall	Loam	3e	1
23D:			
Beisigl	Sand	6e	10
Telfer	Sand	6e	10
24:			
Arnegard	Loam	2c	1
25:			
Farnuf	Loam	2c	3
25B:			
Farnuf	Loam	2e	3
25C:			
Farnuf	Loam	3e	3
26:			
Tansem	Loam	2c	3
Roseglen	Overflow	2c	1
26B:			
Tansem	Loam	2e	3
Roseglen	Overflow	2e	1
27:			
Golva	Loam	2c	3
27B:			
Golva	Loam	2e	3
27C:			
Golva	Loam	3e	3
29:			
Savage	Clayey Subsoil	2s	4
29B:			
Savage	Clayey Subsoil	2e	4
29C:			
Savage	Clayey Subsoil	3e	4
30:			
Lawther	Clayey Subsoil	2e	4C
31B:			
Cherry	Limy Upland	2e	8
31C:			
Cherry	Limy Upland	3e	8

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
32F:			
Cherry	Limy Upland	6e	10
Cabba	Not suited	7e	10
33:			
Belfield	Clayey Subsoil	2s	4
Grail	Clayey Subsoil	2c	1
33B:			
Belfield	Clayey Subsoil	2e	4
Savage	Clayey Subsoil	2e	4
34B:			
Daglum	Claypan	4s	9C
Belfield	Clayey Subsoil	2e	4
36B:			
Rhoades	Not suited	6s	10
Daglum	Claypan	4s	9C
38B:			
Dogtooth	Not suited	6s	10
Janesburg	Claypan	4s	9C
38F:			
Dogtooth	Not suited	7s	10
Janesburg	Claypan	6s	10
Cabba	Not suited	7e	10
40B:			
Desart	Very Droughty Loam	4s	9L
Janesburg	Claypan	4s	9C
Ekalaka	Claypan	4s	9L
41:			
Williams	Loam	2c	3
Bowbells	Overflow	2c	1
41B:			
Williams	Loam	2e	3
Bowbells	Overflow	2e	1
42B:			
Williams	Loam	2e	3
Zahl	Limy Upland	3e	8
42C:			
Williams	Loam	3e	3

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
43C:			
Williams	Loam	3e	3
Zahl	Limy Upland	4e	8
44D:			
Zahl	Limy Upland	6e	10
Williams	Loam	4e	3
44E:			
Zahl	Limy Upland	7e	10
Williams	Steep Loam	6e	10
45F:			
Zahl	Not suited	7e	10
Cabba	Not suited	7e	10
Maschetah	Limy Upland	4e	8
46B:			
Dooley	Loam	3e	3
Zahl	Limy Upland	3e	8
46C:			
Dooley	Loam	4e	3
Zahl	Limy Upland	4e	8
46D:			
Dooley	Loam	6e	3
Zahl	Limy Upland	6e	10
48:			
Temvik	Loam	2c	3
Wilton	Overflow	2c	1
49:			
Temvik	Loam	2c	3
Williams	Loam	2c	3
49B:			
Temvik	Loam	2e	3
Williams	Loam	2e	3
50B:			
Temvik	Loam	2e	3
Zahl	Limy Upland	3e	8
51B:			
Amor	Droughty Loam	2e	6D
Shambo	Loam	2e	3

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
51C:			
Amor	Droughty Loam	3e	6D
Cabba	Not suited	6e	10
51D:			
Amor	Droughty Loam	4e	6D
Cabba	Not suited	6e	10
52B:			
Reeder	Droughty Loam	2e	6D
Farnuf	Loam	2e	3
52C:			
Reeder	Droughty Loam	3e	6D
Cabba	Not suited	6e	10
53B:			
Chama	Limy Upland	3e	8
Sen	Droughty Loam	2e	6D
Cabba	Not suited	6s	10
53C:			
Chama	Limy Upland	4e	8
Cabba	Not suited	6e	10
Sen	Droughty Loam	3e	6D
53D:			
Cabba	Not suited	6e	10
Chama	Limy Upland	6e	10
Sen	Droughty Loam	4e	6D
54F:			
Cabba	Not suited	7e	10
Sen	Not suited	6e	10
Chama	Not suited	7e	10
55B:			
Sen	Droughty Loam	2e	6D
Janesburg	Claypan	4s	9C
56B:			
Lefor	Droughty Loam	3e	6D
56C:			
Lefor	Droughty Loam	4e	6D
61D:			
Beisigl	Sand	6e	10
Flasher	Not suited	6e	10

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
61F:			
Beisigl	Not suited	7e	10
Flasher	Not suited	7e	10
Tally	Droughty Loam	6e	5
62F:			
Flasher	Not suited	7e	10
Rock outcrop	Not suited	8s	10
Vebar	Not suited	7e	10
63B:			
Vebar	Very Droughty Loam	3e	6D
Flasher	Not suited	6e	10
63C:			
Vebar	Very Droughty Loam	4e	6D
Flasher	Not suited	6e	10
63D:			
Vebar	Not suited	6e	6D
Flasher	Not suited	6e	10
Tally	Droughty Loam	6e	5
66B:			
Manning	Very Droughty Loam	3e	6G
70B:			
Regent	Clayey Subsoil	2e	4
Savage	Clayey Subsoil	2e	4
70C:			
Regent	Clayey Subsoil	3e	4
Cabba	Not suited	6e	10
71B:			
Regent	Clayey Subsoil	2e	4
Janesburg	Claypan	4s	9C
71C:			
Regent	Clayey Subsoil	3e	4
Janesburg	Claypan	6s	9C
72B:			
Moreau	Clayey Subsoil	3e	4C
72C:			
Moreau	Clayey Subsoil	4e	4C
Wayden	Not suited	6s	10

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
72D:			
Moreau	Clayey Subsoil	6e	4C
Cabba	Not suited	6e	10
80:			
Badland, high precipitation	---	8e	10
83F:			
Cabba	Not suited	7e	10
Badland, outcrop	---	8	10
84F:			
Cabba	Not suited	7e	10
Chama	Not suited	7e	10
Havrelon	Overflow	2e	1K
88D:			
Brandenburg	Not suited	6s	10
Searing	Droughty Loam	4e	6D
Dogtooth	Not suited	6s	10
88F:			
Brandenburg	Not suited	7s	10
Cabba	Not suited	7e	10
Dogtooth	Not suited	7s	10
89F:			
Brandenburg	Not suited	7s	10
Cabba	Not suited	7e	10
Badland, outcrop	---	8e	10
90E:			
Manning	Very Droughty Loam	6e	6G
Schaller	Not suited	7e	10
Wabek	Not suited	7s	10
91F:			
Wabek	Not suited	7s	10
Zahl	Not suited	7e	10
93B:			
Lehr	Very Droughty Loam	3e	6G
Stady	Droughty Loam	3e	6G
94B:			
Searing	Droughty Loam	3e	6G
Ringling	Not suited	6s	10

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
95:			
Havrelon	Overflow	2e	1K
96:			
Pits, gravel and sand	---	8s	10
98F:			
Tinsley	Not suited	7s	10
Chanta	Droughty Loam	6e	6G
99:			
Mckeen	Not suited	5w	10
100F:			
Boxwell	Not suited	7e	10
Cabbart	Not suited	7e	10
Arikara	Not suited	7e	10
101F:			
Cabbart	Not suited	7e	10
Badland, outcrop	---	8e	10
102B:			
Kremlin	Loam	2e	3
Ethridge	Clayey Subsoil	2e	4
Gerda	Not suited	6s	10
103B:			
Chinook	Droughty Loam	3e	5
Rhame	Very Droughty Loam	3e	6D
103D:			
Rhame	Not suited	6e	6D
Chinook	Droughty Loam	6e	5
103F:			
Rhame	Not suited	7e	10
Fleak	Not suited	7e	10
104E:			
Badland, outcrop	---	8e	10
Patent	Limy Upland	7e	10
105:			
Havre	Loam	2e	1K
106:			
Glendive	Droughty Loam	3e	5
107:			
Kremlin	Loam	2c	3

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
108B:			
Hanly	Very Droughty Loam	4e	7
109:			
Havre, wooded	Not suited	2e	1K
110B:			
Maltese	Claypan	4s	9C
Gerda	Not suited	6s	10
111D:			
Gerda	Not suited	6s	10
Kirby	Not suited	6s	10
111F:			
Kirby	Not suited	7s	10
Scairt	Not suited	7s	10
112F:			
Kirby	Not suited	7s	10
Badland, outcrop	---	8e	10
Patent	Limy Upland	7e	10
113F:			
Lonna	Limy Upland	4e	10
Cabbart	Not suited	7e	10
114:			
Channel	---	---	10
Glendive	Overflow	6w	10
Havre	Overflow	6w	10
115F:			
Badland, outcrop	Not suited	8e	10
Arikara	Not suited	7e	10
Cabbart	Not suited	7e	10
116F:			
Kremlin	Loam	4e	3
Cabbart	Not suited	7e	10
117:			
Wolf Point	Clayey Subsoil	2s	4C
118F:			
Lonna	Limy Upland	6e	10
Kirby	Not suited	7s	10
Cabbart	Not suited	7e	10

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
119F:			
Patent	Limy Upland	6e	10
Badland, outcrop	Not suited	8e	10
Cabbart	Not suited	7e	10
121F:			
Maltese	Claypan	6s	9C
Lonna	Steep Loam	6e	10
Arikara	Not suited	7e	10
127:			
Maschetah	Limy Upland	3e	8
127B:			
Maschetah	Limy Upland	3e	8
127C:			
Maschetah	Limy Upland	4e	8
131B:			
Lonna	Limy Upland	2e	8
131C:			
Lonna	Limy Upland	3e	8
132C:			
Patent	Limy Upland	4e	8
Gerda	Not suited	6s	10
Slickspots	Not suited	8s	10
138E:			
Scairt	Not suited	6s	10
Maltese	Claypan	6s	9C
Boxwell	Droughty Loam	4e	6D
145F:			
Zahl	Not suited	7e	10
Cabba	Not suited	7e	10
Arikara	Not suited	7e	10
146B:			
Dooley	Loam	3e	3
151B:			
Boxwell	Droughty Loam	2e	6D
Kremlin	Loam	2e	3
151D:			
Boxwell	Droughty Loam	4e	6D
Kremlin	Loam	4e	3

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
154F:			
Arikara	Not suited	7e	10
Shambo	Not suited	7e	10
Cabba	Not suited	7e	10
161F:			
Beisigl	Not suited	7e	10
Flasher	Not suited	7e	10
Arikara	Not suited	7e	10
164D:			
Vebar, extremely stony	Not suited	7s	10
171:			
Lohler, moderately saline	Saline	3s	9W
180:			
Badland	---	8e	10
183F:			
Badland, outcrop	---	8e	10
Cabba	Not suited	7e	10
187F:			
Arikara	Not suited	7e	10
Cabbart	Not suited	7e	10
193B:			
Chanta	Droughty Loam	3e	6G
194F:			
Kirby	Not suited	7s	10
Arikara	Not suited	7e	10
Badland, outcrop	---	8e	10
195:			
Havrelon	Saline Lowland	3s	9W
199:			
Mckeen	Not suited	8w	10
201F:			
Badland, outcrop	---	8e	10
Cabbart	Not suited	7e	10
202D:			
Boxwell	Droughty Loam	4e	6D
Scairt	Not suited	6s	10
Maltese	Claypan	6s	9C

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
203D:			
Rhame	Not suited	6e	6D
Kremlin	Loam	3e	3
Maltese	Claypan	4s	9C
203F:			
Rhame	Not suited	7e	10
Scairt	Not suited	7s	10
Kremlin	Steep Loam	6e	10
205:			
Havre, rarely flooded	Loam	2e	1K
206:			
Glendive, rarely flooded	Droughty Loam	3e	5
207:			
Harriet	Not suited	6s	10
211F:			
Cabba	Not suited	7e	10
Badland, outcrop	Not suited	8e	10
Arikara	Not suited	7e	10
212:			
Trembles	Overflow	3e	5
213:			
Havrelon, slightly wet	Overflow	2e	1K
214:			
Channel	---	--	10
Korchea, wooded-	Not suited	6w	10
217:			
Wolf Point, wooded	Not suited	2s	4C
218F:			
Cherry	Limy Upland	4e	8
Cabba	Not suited	7e	10
Brandenburg	Not suited	7s	10
227:			
Haydraw	Limy Upland	3e	8
227B:			
Haydraw	Limy Upland	3e	8

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
231C:			
Patent	Limy Upland	4e	8
Gullied land	Not suited	8e	10
Glendive	Droughty Loam	3e	5
232C:			
Lambert	Limy Upland	4e	8
Slickspots	---	8s	10
Rhoades	Not suited	6s	10
238B:			
Janesburg	Claypan	4s	9C
Dogtooth	Not suited	6s	10
239D:			
Vebar	Very Droughty Loam	6e	6D
Janesburg	Claypan	6s	9C
242F:			
Zahl	Not suited	7e	10
Williams	Not suited	7e	10
Arikara	Not suited	7e	10
287F:			
Arikara	Not suited	7e	10
Cabba	Not suited	7e	10
299:			
Minnewaukan	Wet	6w	10
Banks	Sand	4e	7
Riverwash	---	8w	10
317:			
Lallie	Wet	4w	2K
331B:			
Cherry	Limy Upland	2e	8
Gullied land	Not suited	8e	10
Havrelon	Overflow	2e	1K
340B:			
Niobell	Clayey Subsoil	2e	4
Williams	Loam	2e	3
341B:			
Noonan	Claypan	4s	9L
Niobell	Clayey Subsoil	2e	4
Williams	Loam	2e	3

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
341C:			
Noonan	Claypan	4s	9L
Williams	Loam	3e	3
403F:			
Rhame	Not suited	7e	10
Arikara	Not suited	7e	10
Fleak	Not suited	7e	10
404F:			
Badland, outcrop	Not suited	8e	10
Lambert	Limy Upland	6e	10
Cabba	Not suited	7e	10
406:			
Glendive, wooded	Not suited	3e	5
408B:			
Hanly, wooded	Not suited	4e	7
410:			
Riverwash	Not suited	8w	10
411B:			
Lambert	Limy Upland	3e	8
412E:			
Lambert	Limy Upland	3e	8
Brandenburg	Not suited	7s	10
442F:			
Zahl	Not suited	7e	10
Williams	Steep Loam	6e	10
460C:			
Zahl	Limy Upland	4e	8
Williams	Loam	3e	3
Cabba	Not suited	6e	10
460D:			
Zahl	Limy Upland	6e	10
Cabba	Not suited	6e	10
Williams	Loam	4e	3
470C:			
Zahl	Limy Upland	4e	8
Tally	Droughty Loam	4e	5
Williams	Loam	3e	3

Interpretive Groupings Report--Continued

Map symbol and soil name	Forage suitability group	Land capability class	Windbreak suitability group
470D:			
Zahl	Limy Upland	6e	10
Beisigl	Sand	6e	10
Tally	Droughty Loam	6e	5
490:			
Riverwash	Not suited	8w	10
496:			
Pits, gravel and sand, low precipitation	Not suited	8s	10
M-W:			
Miscellaneous water	---	---	10
W:			
Water	---	---	10

Rangeland

Rangeland makes up about 677,400 acres or 37 percent of the land in McKenzie County. The majority of rangeland is on rolling to steep, dissected uplands. The soils are generally unsuited to poorly suited for cultivated crops. Rangeland is used primarily for grazing by domestic livestock; however, it also provides wildlife habitat, watershed protection, recreational areas, and aesthetic value.

Rangeland is defined as land on which the native vegetation (historic climax or natural potential plant community) is predominantly grasses, grasslike plants, forbs, and shrubs. Rangeland includes natural grasslands. Cultural treatments, such as fertilization and cultivation, generally are not used or needed to maintain productivity of rangeland. The composition and production of the plant community are largely determined by soil, climate, topography, and grazing influences.

Ecological Sites

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Soils vary in their capacity to produce grasses and other native plants. Soils that produce similar kinds, proportions, and amounts of vegetation are grouped into an ecological site.

Ecological site is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other ecological sites in kind, amount, and proportion of range plants. Over time, the combination of plants best suited to a particular soil and climate has become established. In the absence of excessive disturbances, this group of plants is the natural plant community or climax community for the site. Natural plant communities are not static but vary slightly from year to year and place to place. The natural potential plant community is generally, but not always, the most productive and diverse combination of plants that may occur on a site.

The relationship between soils and vegetation was determined during this survey. In most cases, ecological sites can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of ecological sites. Soil reaction, salt content, and a seasonal high water table are also important. Many different ecological sites occur in the survey area. Ecological sites for each map unit component under undrained conditions are given in the table, “Ecological Site Report." For a detailed description of the ecological sites in Billings County, see eFOTG at http://www.nrcs.usda.gov/technical/efotg.

Ecological Site Plant Community, Composition, and Production

The characteristic vegetation consists of grasses, grasslikes, forbs, shrubs, and trees that dominate the natural potential plant community on each ecological site. The plant species within these groups are listed by common name. Under composition by weight, the expected percentage of the total annual production is

given for each major species and groups of minor species making up the characteristic vegetation.

The ecological site description helps interpret the ecological and utilitarian values of a given site, including grazing, wildlife habitat, watershed protection, recreation, and others.

Total annual production is the amount of vegetation that can be expected to grow annually on well managed rangeland, supporting the potential natural plant community. It includes all vegetation, whether or not palatable to grazing animals. It includes the current year's herbaceous growth, as well as growth of leaves, twigs, and fruit of woody plants. It does not include the increase in stem diameter of trees and shrubs. Potential production depends on the kind of ecological site. Current production depends on the rangeland similarity index and the amount of moisture available to the plants during the growing season. Production is expressed in pounds per acre of air-dry herbage for favorable, average, and unfavorable years, as determined by the amount and distribution of precipitation and the temperatures favorable to growing conditions.

Rangeland Similarity Index

Rangeland similarity index indicates the present composition of the plant community on an ecological site in relation to the historic climax plant community. Similarity index is determined by comparing the present plant community with the historic climax plant community or the desired plant community which meets the manager’s goals and objectives while protecting the natural resources on a particular ecological site. The more closely the existing community resembles the historic climax plant community, the higher the similarity index.

In some cases the plant community found on a site may not look similar to the historic climax plant community described in the ecological site description. This is usually due to a lower similarity index, reflecting past disturbances, or in some cases long-term exclusion from grazing or fire. Abnormal disturbances that change the historic climax plant community include prolonged overgrazing or season-long grazing, excessive or untimely burning, erosion, and plowing. Under these circumstances, some of the climax plants decrease in proportion while others increase. Also, plants which were not part of the original native plant community may invade the site.

A very severe disturbance, such as plowing, can completely destroy the native plant community, resulting in dominance of annuals or weedy perennials of a lower plant successional status. If the plant community has not deteriorated significantly, it eventually can return to a higher similarity rating under proper range management.

The following paragraphs briefly describe soil and landscape features and limitations associated with ecological sites in Major Land Resource Areas (MLRAs) 54 and 58C. Some of the ecological sites described may not occur in McKenzie County.

Clayey ecological site. These are moderately deep to very deep, moderately well and well drained, moderately fine and fine textured soils. Saturated hydraulic conductivity is slow or very slow and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none to high at depths greater than 16 inches. This site is on nearly level to hilly alluvial plains, lake plains, residual uplands, till plains, and terraces of large streams. Slope ranges from 1 to 25 percent.

Claypan ecological site. These are moderately deep to very deep, moderately well and well drained soils. Saturated hydraulic conductivity is moderately slow to very slow and available water capacity is moderate. They have moderately coarse to moderately fine textured surface layers underlain by a sodium affected subsoil. The subsoils are moderately fine to fine textured and are high in sodium. These dense

sodium affected subsoils restrict root growth. Salinity is moderate to strong at depths greater than 16 inches. This site is on nearly level to hilly alluvial plains, lake plains, residual uplands, and till plains. Slope ranges from 0 to 25 percent.

Closed Depression ecological site. These are very deep, poorly and very poorly drained, fine textured soils. Saturated hydraulic conductivity is slow to very slow. Salinity and sodicity are slight to strong. This site is on enclosed depressions on residual uplands and till plains. Slope ranges from 0 to 1 percent.

Limy Sands ecological site. These are moderately deep, well to somewhat excessively drained, moderately coarse to coarse textured soils. Typically these soils are calcareous throughout, but in some pedons the A horizon is noncalcareous. Saturated hydraulic conductivity is moderately rapid to moderate and available water capacity is low. Salinity is none to very slight and sodicity is none. Soils on this site are moderately to highly susceptible to wind erosion. In severely disturbed areas, blowouts are common. This site is on nearly level to very steep residual uplands. Slope ranges from 1 to 50 percent.

Limy Subirrigated ecological site. These are very deep, somewhat poorly drained, coarse to medium textured soils. These soils have a calcareous subsoil. Saturated hydraulic conductivity is moderately rapid to moderately slow and available water capacity is low to high. Salinity is none to very slight. Soils on this site are moderately to highly susceptible to wind erosion. This site is on flats and swales on lake plains, outwash plains, and till plains. Slope ranges from 0 to 6 percent.

Loamy ecological site. These are moderately deep to very deep, moderately well to well drained, medium and moderately fine textured soils. Saturated hydraulic conductivity is moderate and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none. This site occurs on nearly level to hilly alluvial fans, flood plains, lake plains, residual uplands, and till plains. Slope ranges from 1 to 20 percent.

Loamy Overflow ecological site. These are deep and very deep, moderately well and well drained, moderately coarse to fine textured soils. Saturated hydraulic conductivity is moderate to slow and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none. This site is in swale positions that regularly receive additional run-on from surrounding uplands or flooding. These soils occur on swales, depressions, and footslopes on the lake plains, residual uplands, till plains, and frequently flooded stream terraces and flood plains. Slope ranges from 0 to 6 percent.

Loamy Terrace ecological site. These are moderately deep to very deep, well drained, medium and moderately fine textured soils. Saturated hydraulic conductivity is moderate to moderately slow and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none. This site is on level to gently sloping flood plains and terraces. Flooding frequency ranges from none to occasional. Slope ranges from 0 to 6 percent.

Not Assigned ecological site. These sites indicate current site specific information is not adequate and a field visit is necessary for planning purposes. Includes all miscellaneous land types.

Saline Lowland ecological site. These are moderately deep to very deep, poorly to moderately well drained, coarse to fine textured soils. Saturated hydraulic conductivity is moderately rapid to very slow and available water capacity is low to high. Salinity is moderate, especially in surface layers and sodicity is none to high. Natraquolls are included in this site. This ecological site receives additional moisture from ground water seepage and/or run-on. This site occurs on depressed areas on alluvial fans, flood plains, lake plains, residual uplands, and till plains. Slope ranges from 0 to 6 percent.

Sands ecological site. These are deep to very deep, well to excessively drained, coarse textured soils. Saturated hydraulic conductivity is very rapid to moderately rapid and available water capacity is moderate to very low. Salinity and sodicity are none. Soils on this site are highly susceptible to wind erosion. This site is on nearly level to steep flood plains, lake plains, outwash plains, residual uplands, terraces, and till plains. Slope ranges from 0 to 45 percent.

Sands Subirrigated ecological site. These are deep to very deep, moderately well drained, coarse textured soils. Saturated hydraulic conductivity is very rapid to moderately rapid and available water capacity is moderate to very low. Salinity and sodicity are none. Soils on this site are highly susceptible to wind erosion. A seasonal water tables ranges from 3 feet to 5 feet below the surface. This site is on level to undulating flood plains, lake plains, outwash plains, and terraces. Slopes range from 0 to 6 percent.

Sandy ecological site. These are moderately deep to very deep and well to somewhat excessively drained soils. Soil textures include moderately coarse and moderately coarse over moderately fine and moderately coarse over sandy or sandy skeletal (24 to 40 inches to sand or sand and gravel). Saturated hydraulic conductivity is moderately rapid to moderate and available water capacity is low to moderate. These soils are friable and susceptible to wind erosion. This site is on nearly level to very steep lake plains, outwash plains, residual uplands, and till plains. Slope ranges from 1 to 60 percent.

Sandy Claypan ecological site. These are moderately deep to very deep, moderately well and well drained soils. They have moderately coarse to medium textured surface layers underlain by a sodium affected subsoil. The subsoils are moderately coarse to medium textured and are high in sodium. Saturated hydraulic conductivity is moderate to slow and available water capacity is moderate. Salinity is none to slight and sodicity is high. This site is on nearly level to moderately steep alluvial flats, lake plains, residual uplands, and till plains. Slope ranges from 0 to 25 percent.

Sandy Terrace ecological site. These are moderately deep to very deep, well to somewhat excessively drained, moderately coarse to medium textured soils. Saturated hydraulic conductivity is moderately rapid to moderately slow and available water capacity is moderately low to high. Salinity is none to very slight and sodicity is none. These soils are friable and susceptible to wind erosion. This site is on level to gently sloping flood plains and terraces. Flooding frequency ranges from none to occasional. Slope ranges from 0 to 6 percent.

Shallow Clayey ecological site. These are shallow, well drained, fine textured soils overlying weathered shale at less than 20 inches. Saturated hydraulic conductivity is slow to very slow and available water capacity is low to very low. Salinity and sodicity are none. This site occurs on knolls and ridges on nearly level to very steep residual uplands. Slope ranges from 0 to 70 percent.

Shallow Gravel ecological site. These soils are very deep and somewhat excessively drained. Soil textures include moderately coarse and medium textured soils over sand or sand and gravel between the depths of 14 to 25 inches. Saturated hydraulic conductivity is moderately rapid to moderate in the upper part and very rapid in the lower part. Available water capacity is moderate in the upper part and low to very low in the lower part. Salinity and sodicity are none. This site occurs on flats, rises, and side slopes on outwash plains and terraces. Slope ranges from 0 to 15 percent.

Shallow Loamy ecological site. These are shallow, well drained, medium and moderately fine textured soils overlying weathered mudstone or siltstone at less than 20 inches. Saturated hydraulic conductivity is moderate or moderately slow and available water capacity is low or very low. Salinity and sodicity are none. This site

occurs on knolls and ridges on nearly level to very steep residual uplands. Slope ranges from 0 to 60 percent.

Shallow Sandy ecological site. These are shallow, coarse and moderately coarse textured, well drained soils overlying sandstone at less than 20 inches. Saturated hydraulic conductivity is moderately rapid to moderate and available water capacity is low to very low. Salinity and sodicity are none. Wind erosion is a hazard on denuded areas. This site occurs on knolls and ridges on nearly level to very steep residual uplands. Slope ranges from 0 to 60 percent.

Subirrigated ecological site. These are very deep, somewhat poorly drained, coarse to moderately fine textured soils. Saturated hydraulic conductivity is moderate to moderately slow and available water capacity is low to high. Salinity is none to very slight and sodicity is none. These soils have a high water table (1.5 to 3.5 feet from the surface) which keeps the rooting zone moist for most of the growing season. This site is on flats and swales on alluvial plains, lake plains, outwash plains, and till plains. Slope ranges from 0 to 6 percent.

Thin Claypan ecological site. These are moderately deep to very deep, moderately well and well drained, moderately coarse to fine textured soils. The thin surface layer is underlain by a dense sodium affected subsoil. Saturated hydraulic conductivity is moderate to very slow and available water capacity is low to moderate. Salinity is moderate to strong at depths of less than 16 inches and sodicity is high. This site is on nearly level to strongly sloping flats and side slopes on alluvial plains, lake plains, residual uplands, and till plains. Slope ranges from 0 to 15 percent.

Thin Loamy ecological site. These are moderately deep to very deep, moderately well and well drained, moderately coarse to moderately fine textured soils. These soils have a strongly calcareous subsoil or are calcareous to the surface. Saturated hydraulic conductivity is moderate to moderately slow and available water capacity is high. Salinity is none to very slight and sodicity is none. This site is on side slopes or ridges on nearly level to very steep lake plains, residual uplands, and till plains. Slope ranges from 0 to 60 percent.

Thin Sands ecological site. These are deep and very deep, somewhat excessive and excessively drained, coarse textured soils that have a thin surface horizon. Saturated hydraulic conductivity is moderately rapid to very rapid and available water capacity is moderate to very low. Salinity and sodicity are none. These soils are highly susceptible to wind erosion. This site is on rises and ridges on nearly level to very steep flood plains, lake plains, outwash plains, residual uplands, and terraces. Slope ranges from 0 to 45 percent.

Very Shallow ecological site. These are very deep, excessively drained, moderately coarse and medium textured soils that are very shallow to porcelanite or sand and/or sand and gravel. Saturated hydraulic conductivity is very rapid and available water capacity is low and very low. Salinity and sodicity are none. This site is on flats, rises, and ridges on outwash plains, residual uplands, and terraces. Slope ranges from 1 to 60 percent.

Wet Land ecological site. These are very deep, very poorly drained, coarse to fine textured soils. Salinity and sodicity are none to slight. Water tables on this site range from 1 1/2 feet above to 1/2 foot below the surface during most of the growing season. This site is in deep depressions on flood plains, lake plains, residual uplands, and till plains. Slope ranges from 0 to 3 percent.

Wet Meadow ecological site. These are very deep, poorly drained, coarse to fine textured soils. Saturated hydraulic conductivity is very rapid to slow and available water capacity is low to high. Salinity and sodicity are none to slight. Water tables on this site range from 1/2 foot above to 1 1/2 feet below the surface several weeks during the growing season. The site normally receives additional water from surface runoff and/or underground seepage. This site occurs in flats and depressions on

flood plains, lake plains, residual uplands, and till plains. Slope ranges from 0 to 3 percent.

Range Management

Range management requires knowledge of the kinds of soils and of the historic climax plant community. It also requires an evaluation of the present rangeland similarity index, trend, and health. The primary objective in range management is to manipulate grazing in such a manner that the plants growing on a site are similar in kind and amount to the historic climax or desired plant community for that site. Such management generally results in the optimum production and diversity of vegetation, suppression of undesirable brush and weeds, conservation of water, and control of erosion. Sometimes, however, a rangeland similarity index somewhat below the potential meets forage needs, provides wildlife habitat, and protects soil and water resources.

Ecologically sound range management ensures that the water, nutrient, and energy cycles are properly functioning. Water is conserved, yields are optimized, and soils are protected. An important management concern is recognizing the changes in the plant community that take place gradually and that can be misinterpreted or overlooked. Growth encouraged by heavy rainfall, for example, may lead to the conclusion that the range is in good health when actually the plant cover is weedy and the long-term trend is toward lower production. On the other hand, some rangeland that has been grazed closely for a short period may have a degraded appearance that temporarily obscures its quality and ability to recover rapidly.

Rangeland can recover from prolonged overgrazing or other disturbance if the climax species have not been completely eliminated from the plant community. Generally an adequate population of climax plants remains to restore the rangeland to a high similarity index through sound grazing management. In areas where the climax plant community has been severely disturbed or destroyed, range seeding can accelerate improvement. Seeding the proper climax species also can restore productive rangeland on areas of depleted or low quality cropland or pastureland. Brush suppression, water developments, fencing, and other mechanical practices may be needed to facilitate proper grazing management for range improvement on some rangeland. Proper grazing management is the key to maintaining or improving the productivity and diversity of rangeland.

For additional information about rangeland management, contact the local Natural Resources Conservation Service or Cooperative Extension Service office.

Ecological Site Report

(Dashes (--) indicate an ecological site is not assigned. Ecological sites are for undrained conditions. Minor components are also listed in this table only.)

Map symbol and soil name	Ecological site
2:	
Heil	Closed Depression
Heil, silty clay loam	Closed Depression
Grano	Wet Land
Dimmick	Wet Land
3:	
Dimmick	Wet Land
Parnell	Wet Land
Tonka	Wet Meadow
Grail	Loamy Overflow
5:	
Tonka	Wet Meadow
Hamerly	Subirrigated
Parnell	Wet Land
Heil	Closed Depression
Noonan	Claypan
Divide	Subirrigated
Marysland	Wet Meadow
Niobell	Clayey
Bowbells	Loamy Overflow
7:	
Harriet	Saline Lowland
Regan	Wet Meadow
Slickspots	Not Assigned
Rhoades	Thin Claypan
Heil	Closed Depression
Daglum	Claypan
9:	
Grano	Wet Land
Heil	Closed Depression
Dovray	Wet Land
10:	
Banks	Sandy Terrace
Banks, silty clay loam	Sandy Terrace
Banks, loamy fine sand	Thin Sands

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
10:(cont.)	
Ridgelawn	Loamy Terrace
Trembles	Sandy Terrace
10D:	
Seroco	Thin Sands
Lohler	Loamy Terrace
11B:	
Patent	Thin Loamy
Sham	Sandy Claypan
Lonna	Thin Loamy
Benz	Thin Claypan
Kremlin	Loamy
12:	
Trembles	Sandy Terrace
Havrelon	Loamy Terrace
Channel	Not Assigned
Banks	Sandy Terrace
Korchea	Loamy Terrace
Rhoades	Thin Claypan
13:	
Havrelon	Loamy Terrace
Havrelon, fine sandy loam	Loamy Terrace
Channel	Not Assigned
Banks	Sandy Terrace
Havrelon, silty clay loam	Loamy Terrace
Ridgelawn	Loamy Terrace
Trembles	Sandy Terrace
Lallie	Wet Meadow
14:	
Korchea	Loamy Overflow
Channel	Not Assigned
Velva	Loamy Overflow
15:	
Korchea	Loamy Terrace
Shambo	Loamy
Straw	Loamy Terrace
Channel	Not Assigned

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
15:(cont.)	
Havrelon	Loamy Terrace
Velva	Sandy Terrace
Daglum	Claypan
16:	
Ridgelawn, slightly wet	Loamy Terrace
Banks, loam	Sandy Terrace
Trembles, slightly wet	Sandy Terrace
Havrelon, slightly wet	Loamy Terrace
Lohler, slightly wet	Loamy Terrace
Hoffmanville, slightly wet	Loamy Terrace
17:	
Lohler, slightly wet	Loamy Terrace
Havrelon, slightly wet	Loamy Terrace
Lallie, drained	Wet Meadow
19:	
Hoffmanville, slightly wet	Loamy Terrace
Lohler, slightly wet	Loamy Terrace
Scorio, slightly wet	Loamy Terrace
Ridgelawn, slightly wet	Loamy Terrace
Banks, silty clay	Sandy Terrace
20:	
Scorio, slightly wet	Loamy Terrace
Scorio silty clay loam, slightly wet	Loamy Terrace
Lohler, slightly wet	Loamy Terrace
Scorio, slightly wet	Saline Lowland
Havrelon, slightly wet	Loamy Terrace
21B:	
Tally	Sandy
Parshall	Loamy Overflow
Shambo	Loamy
Arnegard	Loamy Overflow
Lihen	Sands
Krem	Sands
Ekalaka	Sandy Claypan
Lefor	Sandy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
21C:	
Tally	Sandy
Parshall	Loamy Overflow
Parshall, gently sloping	Loamy Overflow
Tally, strongly sloping	Sandy
Telfer	Sands
Vebar	Sandy
Cohagen	Shallow Sandy
Grail	Loamy Overflow
Manning	Sandy
22:	
Velva	Sandy Terrace
Banks	Sandy Terrace
Korchea	Loamy Terrace
Channel	Not Assigned
Breien	Sandy Terrace
Minnewaukan	Wet Meadow
23B:	
Lihen	Sands
Parshall	Loamy Overflow
Telfer	Sands
Tally	Sandy
Stady	Loamy
Lihen, fine sandy loam	Sands
Seroco	Thin Sands
Shambo	Loamy
Beisigl	Limy Sands
Manning	Sandy
23D:	
Beisigl	Limy Sands
Telfer	Sands
Tally	Sandy
Flasher	Shallow Sandy
Vebar	Sandy
Lakota	Thin Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
24:	
Arnegard	Loamy
Farnuf	Loamy
Parshall	Sandy
Belfield	Clayey
Grail	Clayey
Stady	Loamy
Amor	Loamy
Savage	Clayey
25:	
Farnuf	Loamy
Arnegard	Loamy Overflow
Farland	Loamy
Parshall	Loamy Overflow
Shambo	Loamy
Belfield	Clayey
Bowdle	Loamy
Felor	Loamy
Lehr	Shallow Sandy
Reeder	Loamy
25B:	
Farnuf	Loamy
Shambo	Loamy
Arnegard	Loamy Overflow
Belfield	Clayey
Reeder	Loamy
Parshall	Loamy Overflow
Stady	Loamy
Maschetah	Thin Loamy
25C:	
Farnuf	Loamy
Shambo	Loamy
Arnegard	Loamy Overflow
Belfield	Clayey
Cherry	Thin Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
25C:(cont.)	
Savage	Clayey
Tally	Sandy
26:	
Tansem	Loamy
Roseglen	Loamy Overflow
Makoti	Loamy Overflow
Williams	Loamy
Tally	Sandy
Stady	Loamy
26B:	
Tansem	Loamy
Roseglen	Loamy Overflow
Cabba	Shallow Loamy
Sakakawea	Thin Loamy
Lihen	Sands
Parshall	Loamy Overflow
27:	
Golva	Loamy
Golva, silty clay loam	Loamy
Farland	Loamy
Velva	Sandy Terrace
Korchea	Loamy Terrace
Lehr	Shallow Sandy
27B:	
Golva	Loamy
Grassna	Loamy Overflow
Sen	Loamy
Belfield	Clayey
Maschetah	Thin Loamy
Savage	Clayey
Lawther	Clayey
27C:	
Golva	Loamy
Golva, strongly sloping	Loamy
Cherry	Thin Loamy
Grassna	Loamy Overflow

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
27C:(cont.)	
Sen	Loamy
Janesburg	Claypan
Chama	Thin Loamy
Tally	Sandy
29:	
Savage	Clayey
Grail	Loamy Overflow
Belfield	Clayey
Farnuf	Loamy
Regent	Clayey
Daglum	Claypan
Lawther	Clayey
Parshall	Loamy Overflow
29B:	
Savage	Clayey
Grail	Loamy Overflow
Farland	Loamy
Regent	Clayey
Shambo	Loamy
Daglum	Claypan
Amor	Loamy
Stady	Loamy
29C:	
Savage	Clayey
Savage, gently sloping	Clayey
Farnuf	Loamy
Daglum	Claypan
Regent	Clayey
Farland	Loamy
Reeder	Loamy
Grail	Loamy Overflow
Maschetah	Thin Loamy
30:	
Lawther	Clayey
Savage	Clayey

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
30:(cont.)	
Belfield	Clayey
Moreau	Clayey
Daglum	Claypan
Cabba	Shallow Loamy
31B:	
Cherry	Thin Loamy
Maschetah	Thin Loamy
Golva	Loamy
Havrelon	Loamy Terrace
31C:	
Cherry	Thin Loamy
Lambert	Thin Loamy
Maschetah	Thin Loamy
Farnuf	Loamy
Daglum	Claypan
Cabba	Shallow Loamy
32F:	
Cabba	Shallow Loamy
Cherry	Thin Loamy
Cherry, strongly sloping	Thin Loamy
Chama	Thin Loamy
Maschetah	Thin Loamy
Farnuf	Loamy
Lambert	Thin Loamy
Janesburg	Claypan
Amor	Loamy
Badland, outcrop	Not Assigned
33:	
Belfield	Clayey
Grail	Clayey
Savage	Clayey
Daglum	Claypan
Farnuf	Loamy
Arnegard	Loamy
Lawther	Clayey

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
33:(cont.)	
Regent	Clayey
Straw	Loamy Terrace
33B:	
Belfield	Clayey
Savage	Clayey
Daglum	Claypan
Farnuf	Loamy
Grail	Loamy Overflow
Golva	Loamy
34B:	
Daglum	Claypan
Belfield	Clayey
Rhoades	Thin Claypan
Farnuf	Loamy
Savage	Clayey
Lawther	Clayey
Reeder	Loamy
Vebar	Sandy
36B:	
Rhoades	Thin Claypan
Daglum	Claypan
Belfield	Clayey
Savage	Clayey
Moreau	Clayey
Slickspots	Not Assigned
38B:	
Dogtooth	Thin Claypan
Janesburg	Claypan
Daglum	Claypan
Regent	Clayey
Savage	Clayey
Slickspots	Not Assigned
Wayden	Shallow Clayey
Chama	Thin Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
38F:	
Dogtooth	Thin Claypan
Janesburg	Claypan
Cabba	Shallow Loamy
Moreau	Clayey
Wayden	Shallow Clayey
Amor	Loamy
Chama	Thin Loamy
Ekalaka	Sandy Claypan
Regan	Wet Meadow
Slickspots	Not Assigned
40B:	
Desart	Sandy
Ekalaka	Sandy Claypan
Janesburg	Claypan
Tally	Sandy
Daglum	Claypan
Savage	Clayey
Belfield	Clayey
Dogtooth	Thin Claypan
Shambo	Loamy
Heil	Closed Depression
41:	
Williams	Loamy
Bowbells	Loamy Overflow
Max	Loamy
Temvik	Loamy
Tonka	Wet Meadow
Heil	Closed Depression
Manning	Sandy
Reeder	Loamy
41B:	
Williams	Loamy
Bowbells	Loamy Overflow
Max	Loamy
Zahl	Thin Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
41B:(cont.)	
Reeder	Loamy
Tonka	Wet Meadow
Vebar	Sandy
42B:	
Williams	Loamy
Zahl	Thin Loamy
Bowbells	Loamy Overflow
Max	Loamy
Dooley	Sandy
Niobell	Clayey
Amor	Loamy
Chama	Thin Loamy
Tonka	Wet Meadow
42C:	
Williams	Loamy
Williams, undulating	Loamy
Bowbells	Loamy Overflow
Niobell	Clayey
Zahl	Thin Loamy
Moreau	Clayey
Noonan	Claypan
43C:	
Williams	Loamy
Zahl	Thin Loamy
Bowbells	Loamy Overflow
Cabba	Shallow Loamy
Amor	Loamy
Max	Loamy
Williams, undulating	Loamy
Zahl, rolling	Thin Loamy
Noonan	Claypan
44D:	
Zahl	Thin Loamy
Williams	Loamy
Max	Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
44D:(cont.)	
Bowbells	Loamy Overflow
Reeder	Loamy
Cabba	Shallow Loamy
Chama	Thin Loamy
Wabek	Very Shallow
44E:	
Zahl	Thin Loamy
Williams	Loamy
Bowbells	Loamy
Reeder	Loamy
Tally	Sandy
Cohagen	Shallow Sandy
45F:	
Zahl	Thin Loamy
Cabba	Shallow Loamy
Maschetah	Thin Loamy
Williams	Loamy
Chama	Thin Loamy
Straw	Loamy Terrace
Amor	Loamy
Dogtooth	Thin Claypan
Dooley	Sandy
Savage	Clayey
Wabek	Very Shallow
46B:	
Dooley	Sandy
Livona	Sandy
Tally	Sandy
Zahl	Thin Loamy
Williams	Loamy
Bowbells	Loamy Overflow
Flasher	Shallow Sandy
Manning	Sandy
Noonan	Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
46C:	
Dooley	Sandy
Zahl	Thin Loamy
Livona	Sandy
Williams	Loamy
Tally	Sandy
Vebar	Sandy
Beisigl	Limy Sands
Telfer	Sands
46D:	
Dooley	Sandy
Zahl	Thin Loamy
Livona	Sandy
Williams	Loamy
Tally	Sandy
Dooley, moderately sloping	Sandy
Flasher	Shallow Sandy
Niobell	Clayey
Vebar	Sandy
48:	
Temvik	Loamy
Wilton	Loamy Overflow
Williams	Loamy
Grassna	Loamy Overflow
49:	
Temvik	Loamy
Williams	Loamy
Wilton	Loamy Overflow
Max	Loamy
Grassna	Loamy Overflow
49B:	
Temvik	Loamy
Wilton	Loamy Overflow
Williams	Loamy
Max	Loamy
Bryant	Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
49B:(cont.)	
Zahl	Thin Loamy
Flaxton	Sandy
50B:	
Temvik	Loamy
Zahl	Thin Loamy
Williams	Loamy
Max	Loamy
Grassna	Loamy Overflow
51B:	
Amor	Loamy
Shambo	Loamy
Morton	Loamy
Chama	Thin Loamy
Cabba	Shallow Loamy
Arnegard	Loamy Overflow
Vebar	Sandy
51C:	
Amor	Loamy
Cabba	Shallow Loamy
Amor, gently sloping	Loamy
Shambo	Loamy
Chama	Thin Loamy
Cohagen	Shallow Sandy
Regent	Clayey
Savage	Clayey
51D:	
Amor	Loamy
Cabba	Shallow Loamy
Amor, moderately sloping	Loamy
Shambo	Loamy
Chama	Thin Loamy
Cohagen	Shallow Sandy
Vebar	Sandy
Arnegard	Loamy Overflow
Dogtooth	Thin Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
51D:(cont.)	
Regent	Clayey
Savage	Clayey
52B:	
Reeder	Loamy
Farnuf	Loamy
Amor	Loamy
Arnegard	Loamy Overflow
Daglum	Claypan
Regent	Clayey
Savage	Clayey
Cabba	Shallow Loamy
Vebar	Sandy
52C:	
Reeder	Loamy
Cabba	Shallow Loamy
Regent	Clayey
Reeder, gently sloping	Loamy
Regent, gently sloping	Clayey
Farland	Loamy
Williams	Loamy
Chama	Thin Loamy
Lefor	Sandy
53B:	
Chama	Thin Loamy
Sen	Loamy
Cabba	Shallow Loamy
Golva	Loamy
Chama, moderately sloping	Thin Loamy
Janesburg	Claypan
Maschetah	Thin Loamy
53C:	
Chama	Thin Loamy
Cabba	Shallow Loamy
Sen	Loamy
Cohagen	Shallow Sandy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
53C:(cont.)	
Chama, gently sloping	Thin Loamy
Golva	Loamy
Grail	Loamy Overflow
Janesburg	Claypan
Vebar	Sandy
53D:	
Cabba	Shallow Loamy
Chama	Thin Loamy
Sen	Loamy
Vebar	Sandy
Arnegard	Loamy
Cabba, gently sloping	Shallow Loamy
Janesburg	Claypan
Golva	Loamy
Maschetah	Thin Loamy
54F:	
Cabba	Shallow Loamy
Sen	Loamy
Chama	Thin Loamy
Shambo	Loamy
Regent	Clayey
Vebar	Sandy
Janesburg	Claypan
Regan	Wet Meadow
Rock outcrop	Not Assigned
Straw	Loamy Terrace
55B:	
Janesburg	Claypan
Sen	Loamy
Regent	Clayey
Farland	Loamy
Dogtooth	Thin Claypan
Chama	Thin Loamy
Reeder	Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
55B:(cont.)	
Belfield	Clayey
Cabba	Shallow Loamy
56B:	
Lefor	Sandy
Parshall	Loamy Overflow
Vebar	Sandy
Belfield	Clayey
Cohagen	Shallow Sandy
Dogtooth	Thin Claypan
Lihen	Sands
Heil	Closed Depression
56C:	
Lefor	Sandy
Cabba	Shallow Loamy
Regent	Clayey
Parshall	Loamy Overflow
Cohagen	Shallow Sandy
Lefor, strongly sloping	Sandy
Tally	Sandy
Vebar	Sandy
61D:	
Beisigl	Limy Sands
Flasher	Shallow Sandy
Telfer	Sands
Vebar	Sandy
Parshall	Loamy Overflow
61F:	
Beisigl	Limy Sands
Flasher	Shallow Sandy
Tally	Sandy
Vebar	Sandy
Amor	Loamy
Telfer	Sands
Cabba	Shallow Loamy
Regan	Wet Meadow

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
62F:	
Flasher	Shallow Sandy
Rock outcrop	Not Assigned
Vebar	Sandy
Beisigl	Limy Sands
Tally	Sandy
Cohagen	Shallow Sandy
Telfer	Sands
Amor	Loamy
Cabba	Shallow Loamy
63B:	
Vebar	Sandy
Flasher	Shallow Sandy
Cohagen	Shallow Sandy
Tally	Sandy
Amor	Loamy
Beisigl	Limy Sands
Parshall	Loamy Overflow
Dooley	Sandy
Janesburg	Claypan
Arnegard	Loamy Overflow
63C:	
Vebar	Sandy
Tally	Sandy
Flasher	Shallow Sandy
Cohagen	Shallow Sandy
Beisigl	Limy Sands
Amor	Loamy
Arnegard	Loamy Overflow
Zahl	Thin Loamy
Peta, fine sandy loam	Subirrigated
63D:	
Vebar	Sandy
Flasher	Shallow Sandy
Tally	Sandy
Cohagen	Shallow Sandy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
63D:(cont.)	
Vebar, moderately sloping	Sandy
Beisigl	Limy Sands
Parshall	Loamy Overflow
Amor	Loamy
Telfer	Sands
66B:	
Manning	Sandy
Parshall	Loamy Overflow
Stady	Loamy
Shambo, gravelly substratum	Loamy
Wabek	Very Shallow
Vebar	Sandy
70B:	
Regent	Clayey
Savage	Clayey
Moreau	Clayey
Cabba	Shallow Loamy
Chama	Thin Loamy
Daglum	Claypan
Wayden	Shallow Clayey
70C:	
Regent	Clayey
Cabba	Shallow Loamy
Regent, gently sloping	Clayey
Reeder	Loamy
Moreau	Clayey
Wayden	Shallow Clayey
Chama	Thin Loamy
Savage	Clayey
71B:	
Regent	Clayey
Janesburg	Claypan
Belfield	Clayey
Reeder	Loamy
Dogtooth	Thin Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
71B:(cont.)	
Moreau	Clayey
Savage	Clayey
Chama	Thin Loamy
71C:	
Regent	Clayey
Janesburg	Claypan
Regent, gently sloping	Clayey
Belfield	Clayey
Dogtooth	Thin Claypan
Moreau	Clayey
Savage	Clayey
Wayden	Shallow Clayey
Chama	Thin Loamy
72B:	
Moreau	Clayey
Moreau, silty clay loam	Clayey
Wayden	Shallow Clayey
Savage	Clayey
Regent	Clayey
Lawther	Clayey
Janesburg	Claypan
Chama	Thin Loamy
72C:	
Moreau	Clayey
Wayden	Shallow Clayey
Lawther	Clayey
Regent	Clayey
Janesburg	Claypan
Moreau, strongly sloping	Clayey
Cabba	Shallow Loamy
Savage	Clayey
Dogtooth	Thin Claypan
72D:	
Moreau	Clayey
Cabba	Shallow Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
72D:(cont.)	
Chama	Thin Loamy
Morton	Loamy
Regent	Clayey
Lawther	Clayey
Wayden	Shallow Clayey
Farnuf	Loamy
Vebar	Sandy
80:	
Badland, high precipitation	Not Assigned
Cabba	Shallow Loamy
Lambert	Thin Loamy
Moreau	Clayey
83F:	
Cabba	Shallow Loamy
Badland, outcrop	Not Assigned
Chama	Thin Loamy
Flasher	Shallow Sandy
Amor	Loamy
Cherry	Thin Loamy
Arikara	Not Assigned
Lihen	Sands
84F:	
Cabba	Shallow Loamy
Chama	Thin Loamy
Cherry	Thin Loamy
Havrelon	Loamy Terrace
Amor	Loamy
Flasher	Shallow Sandy
Maschetah	Thin Loamy
Dogtooth	Thin Claypan
Savage	Clayey
88D:	
Brandenburg	Very Shallow
Searing	Loamy
Dogtooth	Thin Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
88D:(cont.)	
Regent	Clayey
Cabba	Shallow Loamy
Sen	Loamy
Janesburg	Claypan
Vebar	Sandy
Wayden	Shallow Clayey
88F:	
Brandenburg	Very Shallow
Cabba	Shallow Loamy
Dogtooth	Thin Claypan
Janesburg	Claypan
Amor	Loamy
Searing	Loamy
Chama	Thin Loamy
Rock outcrop	Not Assigned
Farnuf	Loamy
89F:	
Brandenburg	Very Shallow
Cabba	Shallow Loamy
Badland, outcrop	Not Assigned
Dogtooth	Thin Claypan
Chama	Thin Loamy
Rock outcrop	Not Assigned
Flasher	Shallow Sandy
Janesburg	Claypan
Searing	Loamy
Lambert	Thin Loamy
90E:	
Manning	Sandy
Schaller	Sands
Wabek	Very Shallow
Stady	Loamy
Tally	Sandy
Cabba	Shallow Loamy
Janesburg	Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
91F:	
Wabek	Very Shallow
Zahl	Thin Loamy
Manning	Sandy
Williams	Loamy
Schaller	Sands
Stady	Loamy
Arnegard	Loamy Overflow
93B:	
Lehr	Shallow Sandy
Stady	Loamy
Bowdle	Loamy
Shambo	Loamy
Manning	Sandy
Wanagan	Loamy
Wabek	Very Shallow
94B:	
Searing	Loamy
Ringling	Very Shallow
Farnuf	Loamy
Belfield	Clayey
Amor	Loamy
Brandenburg	Very Shallow
Cabba	Shallow Loamy
Chama	Thin Loamy
95:	
Havrelon	Loamy Terrace
Havrelon, silt loam	Loamy Terrace
Lohler	Loamy Terrace
96:	
Pits, gravel and sand	Not Assigned
Wabek	Very Shallow
Lehr	Shallow Sandy
98F:	
Tinsley	Very Shallow
Chanta	Loamy
Chinook	Sandy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
98F:(cont.)	
Cozberg	Sandy
Cabbart	Shallow Loamy
Rhame	Sandy
Kremlin	Loamy
99:	
Mckeen	Wet Land
Lallie	Wet Meadow
Scorio, saline	Saline Lowland
Scorio, silty clay loam	Loamy Terrace
100F:	
Boxwell	Loamy
Cabbart	Shallow Loamy
Arikara	Not Assigned
Rhame	Sandy
Ethridge	Clayey
Maltese	Claypan
Scairt	Thin Claypan
Fleak	Shallow Sandy
Badland, outcrop	Not Assigned
101F:	
Cabbart	Shallow Loamy
Badland, outcrop	Not Assigned
Boxwell	Loamy
Patent	Thin Loamy
Blacksheep	Shallow Sandy
Fleak	Shallow Sandy
Kirby	Very Shallow
Kremlin	Loamy
Gerda	Thin Claypan
102B:	
Kremlin	Loamy
Ethridge	Clayey
Gerda	Thin Claypan
Maltese	Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
102B:(cont.)	
Boxwell	Loamy
Patent	Thin Loamy
103B:	
Chinook	Sandy
Rhame	Sandy
Kremlin	Loamy
Boxwell	Loamy
Chinook, moderately sloping	Sandy
Blacksheep	Shallow Sandy
Ethridge	Clayey
Maltese	Claypan
103D:	
Rhame	Sandy
Chinook	Sandy
Kremlin	Loamy
Tusler	Limy Sands
Blacksheep	Shallow Sandy
Fleak	Shallow Sandy
Maltese	Claypan
Burgraff	Thin Loamy
103F:	
Rhame	Sandy
Fleak	Shallow Sandy
Chinook	Sandy
Blacksheep	Shallow Sandy
Cabbart	Shallow Loamy
Rhame, strongly sloping	Sandy
Tusler	Limy Sands
Kremlin	Loamy
Rock outcrop	Not Assigned
Gerda	Thin Claypan
104E:	
Badland, outcrop	Not Assigned
Patent	Thin Loamy
Patent, moderately steep	Thin Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
104E:(cont.)	
Cabbart	Shallow Loamy
Lonna	Thin Loamy
Scoria outcrop	Not Assigned
Havre	Loamy Terrace
105:	
Havre	Loamy Terrace
Havre, loam	Loamy Terrace
Glendive	Sandy Terrace
Channel	Not Assigned
Kremlin	Loamy
Wolf Point	Loamy Terrace
106:	
Glendive	Sandy Terrace
Hanly	Sandy Terrace
Glendive, loam	Sandy Terrace
Channel	Not Assigned
Havre	Loamy Terrace
107:	
Kremlin	Loamy
Littlemo	Loamy
Chanta	Loamy
Chinook	Sandy
Haydraw	Loamy
108B:	
Hanly	Sandy Terrace
Glendive	Sandy Terrace
Minnewaukan	Wet Meadow
Riverwash	Not Assigned
109:	
Havre, wooded	Loamy Terrace
Glendive, wooded	Sandy Terrace
Channel	Not Assigned
Wolf Point	Loamy Terrace
Kremlin	Loamy
Harriet	Saline Lowland

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
110B:	
Maltese	Claypan
Gerda	Thin Claypan
Tanna	Clayey
Kremlin	Loamy
Scairt	Thin Claypan
Lonna	Loamy
Rhame	Sandy
Slickspots	Not Assigned
111D:	
Kirby	Very Shallow
Scairt	Thin Claypan
Gerda	Thin Claypan
Kremlin	Loamy
Absher	Thin Claypan
Maltese	Claypan
Searing, aridic-ustic	Loamy
Cabbart	Shallow Loamy
Ethridge	Clayey
Harriet	Saline Lowland
111F:	
Kirby	Very Shallow
Scairt	Thin Claypan
Cabbart	Shallow Loamy
Kremlin	Loamy
Searing, aridic-ustic	Loamy
Boxwell	Loamy
Maltese	Claypan
Rhame	Sandy
Badland, outcrop	Not Assigned
112F:	
Kirby	Very Shallow
Badland, outcrop	Not Assigned
Cabbart	Shallow Loamy
Patent	Thin Loamy
Patent, strongly sloping	Thin Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
112F:(cont.)	
Maltese	Claypan
Kremlin	Loamy
113F:	
Lonna	Thin Loamy
Cabbart	Shallow Loamy
Lonna, moderately steep	Loamy
Kremlin	Loamy
Gerda	Thin Claypan
Blacksheep	Shallow Sandy
Ethridge	Clayey
Arikara	Not Assigned
114:	
Channel	Not Assigned
Glendive	Loamy Overflow
Havre	Loamy Overflow
Hanly	Loamy Overflow
Lonna	Loamy
Regan	Wet Meadow
115F:	
Badland, outcrop	Not Assigned
Arikara	Not Assigned
Cabbart	Shallow Loamy
Boxwell	Loamy
Lonna	Thin Loamy
Kirby	Very Shallow
Rhame	Sandy
Scairt	Thin Claypan
116F:	
Cabbart	Shallow Loamy
Kremlin	Loamy
Boxwell	Loamy
Scairt	Thin Claypan
Lonna	Thin Loamy
Badland, outcrop	Not Assigned
Fleak	Shallow Sandy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
117:	
Wolf Point	Loamy Terrace
Havre	Loamy Terrace
Channel	Not Assigned
Ethridge	Clayey
Glendive	Sandy Terrace
118F:	
Lonna	Thin Loamy
Kirby	Very Shallow
Cabbart	Shallow Loamy
Boxwell	Loamy
Maltese	Claypan
Scairt	Thin Claypan
Scoria outcrop	Not Assigned
119F:	
Patent	Thin Loamy
Badland, outcrop	Not Assigned
Cabbart	Shallow Loamy
Lonna	Thin Loamy
Gerda	Thin Claypan
Kremlin	Loamy
Arikara	Not Assigned
Kirby	Very Shallow
Maltese	Claypan
121F:	
Maltese	Claypan
Lonna	Thin Loamy
Arikara	Not Assigned
Scairt	Thin Claypan
Tanna	Clayey
Cabbart	Shallow Loamy
Lallie	Wet Meadow
Yawdim	Shallow Clayey
127:	
Maschetah	Thin Loamy
Cherry	Thin Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
127:(cont.)	
Farnuf	Loamy
Grassna	Loamy Overflow
Belfield	Clayey
Straw	Loamy Terrace
127B:	
Maschetah	Thin Loamy
Cherry	Thin Loamy
Golva	Loamy
127C:	
Maschetah	Thin Loamy
Cherry	Thin Loamy
Cherry, strongly sloping	Thin Loamy
Golva	Loamy
Maschetah, strongly sloping	Thin Loamy
Chama	Thin Loamy
Daglum	Claypan
131B:	
Lonna	Thin Loamy
Ethridge	Clayey
Patent	Thin Loamy
Lonna, moderately sloping	Loamy
Maltese	Claypan
131C:	
Lonna	Thin Loamy
Lonna, gently sloping	Loamy
Patent	Thin Loamy
Kremlin	Loamy
Sham	Sandy Claypan
Cabbart	Shallow Loamy
132C:	
Patent	Thin Loamy
Gerda	Thin Claypan
Slickspots	Not Assigned
Benz	Thin Claypan
Haydraw	Loamy
Ethridge	Clayey

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
132C:(cont.)	
Chinook	Sandy
Sham	Sandy Claypan
Yawdim	Shallow Clayey
138E:	
Scairt	Thin Claypan
Maltese	Claypan
Gerda	Thin Claypan
Boxwell	Loamy
Cabbart	Shallow Loamy
Kremlin	Loamy
Burgraff	Thin Loamy
Rhame	Sandy
Yawdim	Shallow Clayey
145F:	
Zahl	Thin Loamy
Cabba	Shallow Loamy
Arikara	Not Assigned
Williams	Loamy
Chama	Thin Loamy
Straw	Loamy Terrace
Amor	Loamy
Savage	Clayey
Wabek	Very Shallow
Dogtooth	Thin Claypan
146B:	
Dooley	Sandy
Livona	Sandy
Tally	Sandy
Flaxton	Sandy
Williams	Loamy
Arnegard	Loamy Overflow
Lihen	Sandy
151B:	
Boxwell	Loamy
Kremlin	Loamy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
151B:(cont.)	
Rhame	Sandy
Burgraff	Thin Loamy
Chanta	Loamy
Gerda	Thin Claypan
Cabbart	Shallow Loamy
151D:	
Boxwell	Loamy
Kremlin	Loamy
Cabbart	Shallow Loamy
Kremlin, gently sloping	Loamy
Boxwell, gently sloping	Loamy
Burgraff	Thin Loamy
Haydraw	Loamy
Blacksheep	Shallow Sandy
Maltese	Claypan
154F:	
Arikara	Not Assigned
Shambo	Loamy
Cabba	Shallow Loamy
Lambert	Thin Loamy
Chama	Thin Loamy
Tally	Sandy
Badland, outcrop	Not Assigned
Daglum	Claypan
Regent	Clayey
161F:	
Beisigl	Limy Sands
Flasher	Shallow Sandy
Arikara	Not Assigned
Vebar	Sandy
Cabba	Shallow Loamy
Telfer	Sands
Regan	Wet Meadow
164D:	
Vebar, extremely stony	Sandy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
164D:(cont.)	
Arnegard	Loamy Overflow
Tally	Sandy
Williams, extremely stony	Loamy
Cohagen, extremely stony	Shallow Sandy
Rhoades	Thin Claypan
Flaxton, very stony	Sandy
171:	
Lohler, moderately saline	Saline Lowland
Lohler, slightly saline	Saline Lowland
Lohler, strongly saline	Saline Lowland
180:	
Badland	Not Assigned
Cabbart	Shallow Loamy
Patent	Thin Loamy
Scoria outcrop	Not Assigned
183F:	
Badland, outcrop	Not Assigned
Cabba	Shallow Loamy
Dogtooth	Thin Claypan
Brandenburg	Very Shallow
Chama	Thin Loamy
Lambert	Thin Loamy
Rock outcrop	Not Assigned
187F:	
Arikara	Not Assigned
Cabbart	Shallow Loamy
Havre	Loamy Overflow
Patent	Thin Loamy
193B:	
Chanta	Loamy
Kremlin	Loamy
Tinsley	Very Shallow
194F:	
Kirby	Very Shallow
Arikara	Not Assigned
Badland, outcrop	Not Assigned

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
194F:(cont.)	
Patent	Thin Loamy
Cabbart	Shallow Loamy
Lonna	Thin Loamy
Scairt	Thin Claypan
195:	
Havrelon	Saline Lowland
Trembles	Sandy Terrace
Havrelon, silty clay, moderately saline	Saline Lowland
Scorio	Loamy Terrace
Havrelon, strongly saline	Saline Lowland
Lohler	Loamy Terrace
199:	
Mckeen	Not Assigned
Mckeen, fine sandy loam	Wet Land
Lallie	Wet Land
201F:	
Badland, outcrop	Not Assigned
Cabbart	Shallow Loamy
Arikara	Not Assigned
Boxwell	Loamy
Patent	Thin Loamy
Rock outcrop	Not Assigned
202D:	
Boxwell	Loamy
Scairt	Thin Claypan
Maltese	Claypan
Kremlin	Loamy
Burgraff	Thin Loamy
Ethridge	Clayey
Lonna	Loamy
Cabbart	Shallow Loamy
Yawdim	Shallow Clayey
203D:	
Rhame	Sandy
Chinook	Sandy

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
203D:(cont.)	
Kremlin	Loamy
Maltese	Claypan
Blacksheep	Shallow Sandy
Boxwell	Loamy
Ethridge	Clayey
Tusler	Limy Sands
Scairt	Thin Claypan
Heil	Closed Depression
203F:	
Rhame	Sandy
Scairt	Thin Claypan
Kremlin	Loamy
Maltese	Claypan
Kirby	Very Shallow
Cabbart	Shallow Loamy
Fleak	Shallow Sandy
Badland, outcrop	Not Assigned
205:	
Havre, rarely flooded	Loamy Terrace
Channel	Not Assigned
Glendive	Sandy Terrace
Patent	Thin Loamy
206:	
Glendive, rarely flooded	Sandy Terrace
Channel	Not Assigned
Hanly	Sandy Terrace
Havre	Loamy Terrace
Patent	Thin Loamy
207:	
Harriet	Saline Lowland
Slickspots	Not Assigned
Gerda	Thin Claypan
211F:	
Cabba	Shallow Loamy
Badland, outcrop	Not Assigned

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
211F:(cont.)	
Arikara	Not Assigned
Lambert	Thin Loamy
212:	
Trembles	Sandy Terrace
Havrelon	Loamy Terrace
Trembles, loam	Sandy Terrace
Banks	Sandy Terrace
Ridgelawn	Loamy Terrace
213:	
Havrelon, slightly wet	Loamy Terrace
Havrelon, silty clay loam	Loamy Terrace
Lallie	Wet Meadow
Lohler	Loamy Terrace
Trembles	Sandy Terrace
214:	
Korchea, wooded	Loamy Overflow
Channel	Not Assigned
Velva	Loamy Overflow
217:	
Wolf Point, wooded	Loamy Terrace
Havre	Loamy Terrace
Channel	Not Assigned
Glendive	Sandy Terrace
Ethridge	Clayey
218F:	
Cherry	Thin Loamy
Cabba	Shallow Loamy
Brandenburg	Very Shallow
Chama	Thin Loamy
Maschetah	Thin Loamy
Cherry, moderately steep	Thin Loamy
Cohagen	Shallow Sandy
Havrelon	Loamy Terrace
Lambert	Thin Loamy
Janesburg	Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
227:	
Haydraw	Thin Loamy
Floweree	Loamy
Lonna	Loamy
Glendive	Sandy Terrace
227B:	
Haydraw	Thin Loamy
Floweree	Loamy
Ethridge	Clayey
Boxwell	Loamy
231C:	
Patent	Thin Loamy
Gullied land	Not Assigned
Glendive	Sandy Terrace
Lonna	Thin Loamy
Hanly	Sandy Terrace
Kremlin	Loamy
Havre	Loamy Terrace
Gerda	Thin Claypan
Ethridge	Clayey
Sham	Sandy Claypan
232C:	
Lambert	Thin Loamy
Slickspots	Not Assigned
Rhoades	Thin Claypan
Daglum	Claypan
Korell	Loamy Terrace
Rhoades, 6 to 9 percent slopes	Thin Claypan
238B:	
Janesburg	Claypan
Dogtooth	Thin Claypan
Belfield	Clayey
Regent	Clayey
Janesburg, fine sandy loam	Claypan
Moreau	Clayey

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
238B:(cont.)	
Farland	Loamy
Slickspots	Not Assigned
239D:	
Vebar	Sandy
Janesburg	Claypan
Tally	Sandy
Parshall	Not Assigned
Beisigl	Limy Sands
Cohagen	Shallow Sandy
Shambo	Loamy
Dogtooth	Thin Claypan
Telfer	Sands
Sen	Loamy
242F:	
Zahl	Thin Loamy
Williams	Loamy
Arikara	Not Assigned
Williams, strongly sloping	Loamy
Bowbells	Loamy
Rhoades	Thin Claypan
Wabek	Very Shallow
287F:	
Arikara	Not Assigned
Cabba	Shallow Loamy
Korchea	Loamy Overflow
Lambert	Thin Loamy
299:	
Minnewaukan	Subirrigated
Banks	Sands
Riverwash	Not Assigned
317:	
Lallie	Wet Meadow
Havre, frequently flooded	Loamy Overflow
331B:	
Cherry	Thin Loamy
Gullied land	Not Assigned

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
331B:(cont.)	
Havrelon	Loamy Terrace
Maschetah	Thin Loamy
Golva	Loamy
Havrelon, frequently flooded	Loamy Overflow
Lallie	Wet Meadow
Cabba	Shallow Loamy
Channel	Not Assigned
Velva	Sandy Terrace
340B:	
Niobell	Clayey
Williams	Loamy
Noonan	Claypan
Arnegard	Loamy Overflow
Bowbells	Loamy Overflow
Dooley	Sandy
Lehr	Shallow Sandy
Tonka	Wet Meadow
341B:	
Noonan	Claypan
Niobell	Clayey
Williams	Loamy
Zahl	Thin Loamy
Miranda	Thin Claypan
Cabba	Shallow Loamy
Reeder	Loamy
341C:	
Noonan	Claypan
Williams	Loamy
Niobell	Clayey
Williams, gently sloping	Loamy
Janesburg	Claypan
Reeder	Loamy
Dooley	Sandy
Miranda	Thin Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
341C:(cont.)	
Zahl	Thin Loamy
Wabek	Very Shallow
403F:	
Rhame	Sandy
Arikara	Not Assigned
Fleak	Shallow Sandy
Tusler	Limy Sands
Chinook	Sandy
Kremlin	Loamy
Rhame, strongly sloping	Sandy
Blacksheep	Shallow Sandy
Maltese	Claypan
404F:	
Badland, outcrop	Not Assigned
Lambert	Thin Loamy
Cabba	Shallow Loamy
Daglum	Claypan
Rhoades	Thin Claypan
Arikara	Not Assigned
Vebar	Sandy
Havrelon	Loamy Terrace
406:	
Glendive, wooded	Sandy Terrace
Glendive	Sandy Terrace
Hanly	Sandy Terrace
Channel	Not Assigned
Havre	Loamy Terrace
408B:	
Hanly, wooded	Sandy Terrace
Hanly	Sandy Terrace
Glendive	Sandy Terrace
Minnewaukan	Wet Meadow
Riverwash	Not Assigned

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
410:	
Riverwash	Not Assigned
Banks	Sandy Terrace
Minnewaukan	Wet Meadow
411B:	
Lambert	Thin Loamy
Maschetah	Thin Loamy
Cherry	Thin Loamy
412E:	
Lambert	Thin Loamy
Brandenburg	Very Shallow
Searing	Loamy
Daglum	Claypan
Ringling	Very Shallow
Rhoades	Thin Claypan
Cherry	Thin Loamy
Shambo	Loamy
442F:	
Zahl	Thin Loamy
Williams	Loamy
Shambo	Loamy
Bowbells	Loamy Overflow
Cabba	Shallow Loamy
Rhoades	Thin Claypan
Wabek	Very Shallow
Belfield	Clayey
460C:	
Zahl	Thin Loamy
Williams	Loamy
Cabba	Shallow Loamy
Chama	Thin Loamy
Farnuf	Loamy
Reeder	Loamy
Amor	Loamy
Arnegard	Loamy Overflow
Noonan	Claypan

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
460D:	
Zahl	Thin Loamy
Cabba	Shallow Loamy
Williams	Loamy
Chama	Thin Loamy
Farnuf	Loamy
Reeder	Loamy
Janesburg	Claypan
Flasher	Shallow Sandy
Savage	Clayey
Vebar	Sandy
470C:	
Zahl	Thin Loamy
Tally	Sandy
Williams	Loamy
Beisigl	Limy Sands
Vebar	Sandy
Cohagen	Shallow Sandy
Arnegard	Loamy Overflow
Dooley	Sandy
470D:	
Zahl	Thin Loamy
Beisigl	Limy Sands
Tally	Sandy
Williams	Loamy
Dooley	Sandy
Vebar	Sandy
Reeder	Loamy
Telfer	Sands
Janesburg	Claypan
490:	
Riverwash	Not Assigned
Hanly	Sandy Terrace
Minnewaukan	Wet Meadow

Ecological Site Report--Continued

Map symbol and soil name	Ecological site
496:	
Pits, gravel and sand, low precipitation	Not Assigned
Chanta	Loamy
Tinsley	Very Shallow
M-W:	
Miscellaneous water	Not Assigned
W:	
Water	Not Assigned

Recreation

The soils of the survey area are rated in the “Recreation” tables according to limitations that affect their suitability for recreational uses - camp areas, picnic areas, and playgrounds in Part I and paths, trails, and golf fairways in Part II. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. **Not limited** indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. **Somewhat limited** indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. **Very limited** indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in the tables can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability,

and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails used for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens in not considered in the ratings.

Recreation - Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2:							
Heil	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
3:							
Dimmick	61	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
5:							
Tonka	52	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Hamerly	22	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
7:							
Harriet	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Restricted permeability	1.00			Flooding	0.60
9:							
Grano	52	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
10:							
Banks	62	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
10D:							
Seroco	90	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.37	Too sandy	0.37	Slope	1.00
		Slope	0.04	Slope	0.04	Too sandy	0.37

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D:(cont.)							
Lohler	10	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Restricted permeability	0.41	Too clayey	0.50
		Restricted permeability	0.41			Restricted permeabilty	0.41
11B:							
Patent	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Slope	0.50
						Dusty	0.50
12:							
Trembles	77	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
13:							
Havrelon	73	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
14:							
Channel	40	Not rated		Not rated		Not rated	
Korchea	52	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
15:							
Korchea	71	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
16:							
Ridgelawn	58	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
17:							
Lohler	93	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Restricted permeability	0.41	Too clayey	0.50
		Restricted permeability	0.41			Restricted permeability	0.41
19:							
Hoffmanville	74	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Restricted permeability	0.41	Too clayey	0.50
		Restricted permeability	0.41			Restricted permeability	0.41
20:							
Scorio	76	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Restricted permeability	0.41	Too clayey	0.50
		Restricted permeability	0.41			Restricted permeability	0.41
21B:							
Tally	50	Not limited		Not limited		Somewhat limited	
						Slope	0.12

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21B:(cont.)							
Parshall	28	Not limited		Not limited		Somewhat limited	
						Slope	0.12
21C:							
Tally	61	Not limited		Not limited		Very limited	
						Slope	1.00
Parshall	19	Not limited		Not limited		Very limited	
						Slope	1.00
22:							
Velva	75	Very limited		Not limited		Not limited	
		Flooding	1.00				
23B:							
Lihen	38	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Too sandy	0.37
						Slope	0.12
Parshall	15	Not limited		Not limited		Somewhat limited	
						Slope	0.12
23D:							
Beisigl	41	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.79	Too sandy	0.79	Slope	1.00
		Slope	0.37	Slope	0.37	Too sandy	0.79
						Depth to bedrock	0.46
Telfer	31	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.37	Too sandy	0.37	Slope	1.00
		Slope	0.37	Slope	0.37	Too sandy	0.37
24:							
Arnegard	68	Not limited		Not limited		Not limited	
25:							
Farnuf	50	Not limited		Not limited		Not limited	
25B:							
Farnuf	58	Not limited		Not limited		Somewhat limited	
						Slope	0.50
25C:							
Farnuf	67	Not limited		Not limited		Very limited	
						Slope	1.00
26:							
Tansem	64	Not limited		Not limited		Not limited	
Roseglen	20	Not limited		Not limited		Not limited	
26B:							
Tansem	74	Not limited		Not limited		Somewhat limited	
						Slope	0.88
Roseglen	15	Not limited		Not limited		Somewhat limited	
						Slope	0.88
27:							
Golva	67	Not limited		Not limited		Not limited	

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B:							
Golva	62	Not limited		Not limited		Somewhat limited	
						Slope	0.50
27C:							
Golva	67	Not limited		Not limited		Very limited	
						Slope	1.00
29:							
Savage	61	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Restricted permeability	0.05
29B:							
Savage	67	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	0.50
						Restricted permeability	0.05
29C:							
Savage	58	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	1.00
						Restricted permeability	0.05
30:							
Lawther	77	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Restricted permeability	0.41
31B:							
Cherry	76	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	0.12
						Restricted permeability	0.05
31C:							
Cherry	68	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	1.00
						Restricted permeability	0.05
32F:							
Cherry	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.05	Restricted permeability	0.05	Restricted permeability	0.05
Cabba	29	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
33:							
Belfield	49	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.41	Restricted permeability	0.41	Restricted permeability	0.41

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
33:(cont.)							
Grail	26	Somewhat limited Restricted permeability	 0.05	Somewhat limited Restricted permeability	 0.05	Somewhat limited Restricted permeability	 0.05
33B:							
Belfield	42	Somewhat limited Restricted permeability	 0.41	Somewhat limited Restricted permeability	 0.41	Somewhat limited Slope Restricted permeability	 0.50 0.41
Savage	34	Somewhat limited Restricted permeability	 0.05	Somewhat limited Restricted permeability	 0.05	Somewhat limited Slope Restricted permeability	 0.50 0.05
34B:							
Daglum	52	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44
Belfield	17	Somewhat limited Restricted permeability	 0.41	Somewhat limited Restricted permeability	 0.41	Somewhat limited Restricted permeability	 0.41
36B:							
Rhoades	55	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44
Daglum	33	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44
38B:							
Dogtooth	59	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Depth to bedrock Restricted permeability Slope	 1.00 0.46 0.44 0.12
Janesburg	27	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Restricted permeability	 1.00 0.44	Very limited Sodium content Depth to bedrock Restricted permeability Slope	 1.00 0.46 0.44 0.12
38F:							
Dogtooth	33	Very limited Slope Sodium content Restricted permeability	 1.00 1.00 0.44	Very limited Slope Sodium content Restricted permeability	 1.00 1.00 0.44	Very limited Slope Sodium content Depth to bedrock Restricted permeability	 1.00 1.00 0.46 0.44

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
38F:(cont.)							
Janesburg	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted permeability	0.44
Cabba	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
40B:							
Desart	24	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
						Slope	0.12
Janesburg	16	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted Permeability	0.44
						Slope	0.12
Ekalaka	22	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
						Slope	0.12
41:							
Williams	47	Not limited		Not limited		Not limited	
Bowbells	37	Not limited		Not limited		Not limited	
41B:							
Williams	60	Not limited		Not limited		Somewhat limited	
						Slope	0.88
Bowbells	27	Not limited		Not limited		Somewhat limited	
						Slope	0.88
42B:							
Williams	49	Not limited		Not limited		Somewhat limited	
						Slope	0.88
Zahl	27	Not limited		Not limited		Somewhat limited	
						Slope	0.88
42C:							
Williams	58	Not limited		Not limited		Very limited	
						Slope	1.00
43C:							
Williams	35	Not limited		Not limited		Very limited	
						Slope	1.00
Zahl	35	Not limited		Not limited		Very limited	
						Slope	1.00

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
44D:							
Zahl	45	Somewhat limited Slope	 0.63	Somewhat limited Slope	 0.63	Very limited Slope	 1.00
Williams	21	Somewhat limited Slope	 0.63	Somewhat limited Slope	 0.63	Very limited Slope	 1.00
44E:							
Zahl	46	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
Williams	30	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
45F:							
Zahl	23	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
Cabba	21	Very limited Depth to bedrock Slope	 1.00 1.00	Very limited Depth to bedrock Slope	 1.00 1.00	Very limited Slope Depth to bedrock	 1.00 1.00
Maschetah	17	Somewhat limited Slope	 0.04	Somewhat limited Slope	 0.04	Very limited Slope	 1.00
46B:							
Dooley	41	Not limited		Not limited		Somewhat limited Slope	 0.88
Zahl	12	Not limited		Not limited		Somewhat limited Slope	 0.88
46C:							
Dooley	45	Not limited		Not limited		Very limited Slope	 1.00
Zahl	22	Not limited		Not limited		Very limited Slope	 1.00
46D:							
Dooley	31	Somewhat limited Slope	 0.63	Somewhat limited Slope	 0.63	Very limited Slope	 1.00
Zahl	25	Somewhat limited Slope	 0.63	Somewhat limited Slope	 0.63	Very limited Slope	 1.00
48:							
Temvik	51	Not limited		Not limited		Not limited	
Wilton	38	Not limited		Not limited		Not limited	
49:							
Temvik	47	Not limited		Not limited		Not limited	
Williams	38	Not limited		Not limited		Not limited	
49B:							
Temvik	50	Not limited		Not limited		Somewhat limited Slope	 0.88

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
49B:(cont.)							
Williams	16	Not limited		Not limited		Somewhat limited	
						Slope	0.88
50B:							
Temvik	48	Not limited		Not limited		Somewhat limited	
						Slope	0.88
Zahl	26	Not limited		Not limited		Somewhat limited	
						Slope	0.88
51B:							
Amor	67	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Depth to bedrock	0.46
Shambo	15	Not limited		Not limited		Somewhat limited	
						Slope	0.88
51C:							
Amor	39	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.46
Cabba	29	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Depth to bedrock	1.00
51D:							
Amor	42	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.46
Cabba	29	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00
52B:							
Reeder	49	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Depth to bedrock	0.46
Farnuf	16	Not limited		Not limited		Somewhat limited	
						Slope	0.88
52C:							
Reeder	34	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.46
Cabba	16	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Depth to bedrock	1.00
53B:							
Chama	43	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Depth to bedrock	0.46

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
53B:(cont.)							
Sen	25	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Depth to bedrock	0.46
Cabba	14	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	0.88
53C:							
Chama	40	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.46
Cabba	28	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Depth to bedrock	1.00
Sen	17	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.46
53D:							
Cabba	38	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00
Chama	26	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.46
Sen	16	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.46
54F:							
Cabba	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Sen	18	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.46
Chama	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.46
55B:							
Sen	25	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
						Slope	0.12
Janesburg	34	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted permeability	0.44
						Slope	0.12

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
56B:							
Lefor	78	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
						Slope	0.12
56C:							
Lefor	65	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.46
61D:							
Beisigl	42	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.79	Too sandy	0.79	Slope	1.00
		Slope	0.37	Slope	0.37	Too sandy	0.79
						Depth to bedrock	0.46
Flasher	28	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too sandy	0.79	Too sandy	0.79	Depth to bedrock	1.00
		Slope	0.37	Slope	0.37	Too sandy	0.79
61F:							
Beisigl	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
						Depth to bedrock	0.46
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
Tally	17	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
		Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
62F:							
Flasher	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
Rock outcrop	22	Not rated		Not rated		Not rated	
Vebar	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.29
63B:							
Vebar	44	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Depth to bedrock	0.46
Flasher	12	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.79	Too sandy	0.79	Slope	0.88
						Too sandy	0.79

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
63C:							
Vebar	54	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.46
Flasher	10	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too sandy	0.79	Too sandy	0.79	Depth to bedrock	1.00
						Too sandy	0.79
63D:							
Vebar	32	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.46
Flasher	16	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too sandy	0.79	Too sandy	0.79	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Too sandy	0.79
Tally	15	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
66B:							
Manning	66	Not limited		Not limited		Somewhat limited	
						Slope	0.12
70B:							
Regent	71	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	0.88
						Depth to bedrock	0.46
						Restricted permeability	0.41
Savage	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	0.50
						Restricted permeability	0.05
70C:							
Regent	43	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	1.00
						Depth to bedrock	0.46
						Restricted permeability	0.41
Cabba	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Depth to bedrock	1.00
71B:							
Regent	38	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Depth to bedrock	0.46
						Restricted permeability	0.41
						Slope	0.12

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
71B:(cont.)							
Janesburg	28	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted permeability	0.44
						Slope	0.12
71C:							
Regent	32	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	1.00
						Depth to bedrock	0.46
						Restricted permeability	0.41
Janesburg	31	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Sodium content	1.00
						Depth to bedrock	0.46
						Restricted permeability	0.44
72B:							
Moreau	46	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Depth to bedrock	0.46
						Restricted permeability	0.41
						Slope	0.12
72C:							
Moreau	46	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Slope	1.00
		Restricted permeability	0.41	Restricted permeability	0.41	Too clayey	0.50
						Depth to bedrock	0.46
						Restricted permeability	0.41
Wayden	17	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	0.50	Too clayey	0.50	Depth to bedrock	1.00
		Restricted permeability	0.41	Restricted permeability	0.41	Too clayey	0.50
						Restricted permeability	0.41
72D:							
Moreau	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Depth to bedrock	0.46
						Restricted permeability	0.41
Cabba	27	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00
80:							
Badland, high precipitation	90	Not rated		Not rated		Not rated	

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
83F:							
Cabba	46	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
Badland, outcrop	36	Not rated		Not rated		Not rated	
84F:							
Cabba	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
Chama	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.46
Havrelon	14	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Slope	0.88
						Flooding	0.60
88D:							
Brandenburg	39	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.59	Gravel content	0.59	Slope	1.00
		Slope	0.37	Slope	0.37	Gravel content	1.00
Searing	21	Not limited		Not limited		Very limited	
						Slope	1.00
Dogtooth	12	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Sodium content	1.00
						Depth to bedrock	0.46
		Slope	0.37	Slope	0.37	Restricted permeability	0.44
88F:							
Brandenburg	38	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.59	Gravel content	0.59	Gravel content	1.00
Cabba	17	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Dogtooth	12	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted permeability	0.44
89F:							
Brandenburg	28	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.59	Gravel content	0.59	Gravel content	1.00
Cabba	22	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
Badland, outcrop	16	Not rated		Not rated		Not rated	

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
90E:							
Manning	24	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
Schaller	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Wabek	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
91F:							
Wabek	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Zahl	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
93B:							
Lehr	37	Not limited		Not limited		Somewhat limited	
						Slope	0.12
Stady	27	Not limited		Not limited		Somewhat limited	
						Slope	0.12
94B:							
Searing	60	Not limited		Not limited		Somewhat limited	
						Slope	0.12
Ringling	19	Not limited		Not limited		Somewhat limited	
						Slope	0.50
						Gravel content	0.03
						Content of large stones	0.01
95:							
Havrelon	96	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Restricted permeability	0.05	Too clayey	0.50
		Restricted permeability	0.05			Restricted permeability	0.05
96:							
Pits, gravel and sand	85	Not rated		Not rated		Not rated	
98F:							
Tinsley	53	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
						Content of large stones	0.01
Chanta	17	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
99:							
Mckeen	73	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.40	Flooding	1.00
100F:							
Boxwell	34	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Depth to bedrock	0.46
Cabbart	32	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Arikara	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
101F:							
Cabbart	41	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Badland, outcrop	27	Not rated		Not rated		Not rated	
102B:							
Kremlin	26	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
Ethridge	22	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Dusty	0.50
						Restricted permeability	0.41
Gerda	19	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
						Slope	0.12
103B:							
Chinook	42	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Rhame	28	Not limited		Not limited		Somewhat limited	
						Slope	0.50
						Depth to bedrock	0.46
103D:							
Rhame	42	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
						Depth to bedrock	0.46
Chinook	32	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
103F:							
Rhame	29	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.46
Fleak	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
104E:							
Badland, outcrop	54	Not rated		Not rated		Not rated	
Patent	25	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Dusty	0.50	Slope	1.00
		Dusty	0.50	Slope	0.37	Flooding	0.60
		Slope	0.37			Dusty	0.50
105:							
Havre	77	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Dusty	0.50
106:							
Glendive	70	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
107:							
Kremlin	77	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
108B:							
Hanly	81	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Slope	0.12
109:							
Havre, wooded	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Dusty	0.50
110B:							
Maltese	39	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
						Slope	0.12
Gerda	30	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
						Slope	0.12
111D:							
Gerda	16	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Slope	0.88
						Restricted permeability	0.44

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
111D:(cont.)							
Kirby	23	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.76	Gravel content	0.76	Slope	1.00
		Dusty	0.50	Dusty	0.50	Gravel content	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
						Content of large stones	0.03
111F:							
Kirby	49	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.76	Gravel content	0.76	Gravel content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Content of large stones	0.03
Scairt	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted permeability	0.44
112F:							
Kirby	39	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.76	Gravel content	0.76	Gravel content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Content of large stones	0.03
Badland, outcrop	23	Not rated		Not rated		Not rated	
Patent	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Dusty	0.50
113F:							
Lonna	34	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
Cabbart	33	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
114:							
Channel	40	Not rated		Not rated		Not rated	
Glendive	35	Very limited		Not limited		Not limited	
		Flooding	1.00				
Havre	18	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Dusty	0.50
		Dusty	0.50				

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
115F:							
Badland, outcrop----	30	Not rated		Not rated		Not rated	
Arikara----------	28	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabbart----------	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
116F:							
Kremlin----------	19	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Cabbart----------	29	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
117:							
Wolf Point----------	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.41	Flooding	0.60
		Restricted permeability	0.41			Restricted permeability	0.41
118F:							
Lonna----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Kirby----------	34	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.76	Gravel content	0.76	Gravel content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Content of large stones	0.03
Cabbart----------	16	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
119F:							
Patent----------	33	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Dusty	0.50	Slope	1.00
		Dusty	0.50	Slope	0.37	Flooding	0.60
		Slope	0.37			Dusty	0.50
Badland, outcrop----	21	Not rated		Not rated		Not rated	
Cabbart----------	21	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
121F:							
Maltese	25	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Dusty	0.50
		Slope	0.04	Slope	0.04	Restricted permeability	0.44
Lonna	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Arikara	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
127:							
Maschetah	82	Not limited		Not limited		Not limited	
127B:							
Maschetah	87	Not limited		Not limited		Somewhat limited	
						Slope	0.50
127C:							
Maschetah	70	Not limited		Not limited		Very limited	
						Slope	1.00
131B:							
Lonna	87	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
131C:							
Lonna	64	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
						Dusty	0.50
132C:							
Patent	38	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Slope	0.88
		Dusty	0.50			Flooding	0.60
						Dusty	0.50
Gerda	27	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Slope	0.88
						Restricted permeability	0.44
Slickspots	10	Not rated		Not rated		Not rated	
138E:							
Scairt	31	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Dusty	0.50
		Slope	0.37	Slope	0.37	Depth to bedrock	0.46
						Restricted permeability	0.44

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
138E:(cont.)							
Maltese	22	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Slope	0.96	Slope	0.96	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
Boxwell	10	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
						Depth to bedrock	0.46
145F:							
Zahl	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabba	21	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
Arikara	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
146B:							
Dooley	60	Not limited		Not limited		Somewhat limited	
						Slope	0.12
151B:							
Boxwell	46	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
						Depth to bedrock	0.46
Kremlin	43	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
151D:							
Boxwell	38	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
						Depth to bedrock	0.46
Kremlin	28	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
154F:							
Arikara	33	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Shambo	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabba	18	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
161F:							
Beisigl	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	0.76	Too sandy	0.76	Too sandy	0.76
						Depth to bedrock	0.46
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.37	Too sandy	0.37	Too sandy	0.37
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
164D:							
Vebar, extremely stony	80	Very limited		Very limited		Very limited	
		Too stony	1.00	Too stony	1.00	Too stony	1.00
		Slope	0.04	Slope	0.04	Slope	1.00
						Depth to bedrock	0.46
						Content of large stones	0.46
171:							
Lohler, moderately saline	86	Very limited		Very limited		Very limited	
		Salinity	1.00	Salinity	1.00	Salinity	1.00
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Restricted permeability	0.44	Too clayey	0.50
		Restricted permeability	0.44			Restricted permeability	0.44
180:							
Badland	88	Not rated		Not rated		Not rated	
183F:							
Badland, outcrop	51	Not rated		Not rated		Not rated	
Cabba	32	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
187F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabbart	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
193B:							
Chanta	81	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.12

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
194F:							
Kirby	42	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.76	Gravel content	0.76	Gravel content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Content of large stones	0.03
Arikara	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Badland, outcrop	16	Not rated		Not rated		Not rated	
195:							
Havrelon	42	Very limited		Very limited		Very limited	
		Salinity	1.00	Salinity	1.00	Salinity	1.00
		Flooding	1.00			Flooding	0.60
199:							
Mckeen	78	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Ponding	1.00	Flooding	0.40	Ponding	1.00
201F:							
Badland, outcrop	63	Not rated		Not rated		Not rated	
Cabbart	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
202D:							
Boxwell	27	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
						Depth to bedrock	0.46
Scairt	18	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Dusty	0.50
		Slope	0.37	Slope	0.37	Depth to bedrock	0.46
						Restricted permeability	0.44
Maltese	14	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Dusty	0.50
		Slope	0.37	Slope	0.37	Restricted permeability	0.44
203D:							
Rhame	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
						Depth to bedrock	0.46

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
203D:(cont.)							
Kremlin	16	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Dusty	0.50
Maltese	15	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Slope	0.88
		Restricted permeability	0.44	Restricted permeability	0.44	Dusty	0.50
						Restricted permeability	0.44
203F:							
Rhame	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	0.01	Too sandy	0.01	Depth to bedrock	0.46
						Too sandy	0.01
Scairt	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted Permeability	0.44
Kremlin	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
205:							
Havre, rarely flooded	89	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Dusty	0.50
		Dusty	0.50				
206:							
Glendive, rarely flooded	84	Very limited		Not limited		Not limited	
		Flooding	1.00				
207:							
Harriet	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Restricted permeability	1.00			Flooding	0.60
211F:							
Cabba	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
Badland, outcrop	34	Not rated		Not rated		Not rated	
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
212:							
Trembles	70	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
213:							
Havrelon, slightly wet	92	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
214:							
Channel		Not rated		Not rated		Not rated	
Korchea, wooded	52	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
217:							
Wolf Point, wooded	78	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.41	Flooding	0.60
		Restricted permeability	0.41			Restricted permeability	0.41
218F:							
Cherry	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Restricted permeability	0.05	Restricted permeability	0.05	Restricted permeability	0.05
Cabba	22	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
Brandenburg	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.59	Gravel content	0.59	Gravel content	1.00
227:							
Haydraw	84	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
227B:							
Haydraw	72	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
231C:							
Patent	32	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Slope	0.88
		Dusty	0.50			Flooding	0.60
						Dusty	0.50
Gullied land	19	Not rated		Not rated		Not rated	
Glendive	13	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Slope	0.12
232C:							
Lambert	41	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Slope	0.88
						Flooding	0.60

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
232C:(cont.)							
Slickspots	21	Not rated		Not rated		Not rated	
Rhoades	15	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Slope	0.50
						Restricted permeability	0.44
238B:							
Janesburg	40	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted permeability	0.44
						Slope	0.12
Dogtooth	29	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Depth to bedrock	0.46
						Restricted permeability	0.44
						Slope	0.12
239D:							
Vebar	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
						Depth to bedrock	0.46
Janesburg	19	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Sodium content	1.00
		Slope	0.04	Slope	0.04	Depth to bedrock	1.46
						Restricted permeability	0.44
242F:							
Zahl	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Williams	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Arikara	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
287F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabba	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
299:							
Minnewaukan	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Ponding	1.00	Flooding	1.00
		Ponding	1.00	Flooding	0.40	Ponding	1.00
		Too sandy	0.01	Too sandy	0.01	Too sandy	0.01

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
299:(cont.)							
Banks	30	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.79	Too sandy	0.79
		Too sandy	0.79			Flooding	0.60
Riverwash	30	Not rated		Not rated		Not rated	
317:							
Lallie	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Restricted permeability	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00			Flooding	0.60
331B:							
Cherry	33	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	0.12
						Restricted permeability	0.05
Gullied land	21	Not rated		Not rated		Not rated	
Havrelon	16	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Slope	0.12
340B:							
Niobell	42	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	0.12
						Restricted permeability	0.05
Williams	27	Not limited		Not limited		Somewhat limited	
						Slope	0.12
341B:							
Noonan	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
						Slope	0.12
Niobell	31	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.05	Restricted permeability	0.05	Slope	0.12
						Restricted permeability	0.05
Williams	23	Not limited		Not limited		Somewhat limited	
						Slope	0.12
341C:							
Noonan	23	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.43	Restricted permeability	0.43	Slope	1.00
						Restricted permeability	0.43
Williams	22	Not limited		Not limited		Very limited	
						Slope	1.00

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
403F:							
Rhame	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.46
Arikara	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Fleak	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
404F:							
Badland, outcrop	42	Not rated		Not rated		Not rated	
Lambert	34	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Slope	0.37	Slope	1.00
		Slope	0.37			Flooding	0.60
Cabba	12	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
406:							
Glendive, wooded	74	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
408B:							
Hanly, wooded	61	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Slope	0.12
410:							
Riverwash	85	Not rated		Not rated		Not rated	
411B:							
Lambert	81	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Slope	0.12
412E:							
Lambert	37	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Slope	0.50
Brandenburg	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.59	Gravel content	0.59	Gravel content	1.00
442F:							
Zahl	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Williams	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
460C:							
Zahl	28	Not limited		Not limited		Very limited	
						Slope	1.00

Recreation - Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
460C:(cont.)							
Williams	20	Not limited		Not limited		Very limited Slope	1.00
Cabba	19	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Slope Depth to bedrock	1.00 1.00
460D:							
Zahl	32	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Cabba	24	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Slope Depth to bedrock	1.00 1.00
Williams	13	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
470C:							
Zahl	31	Not limited		Not limited		Very limited Slope	1.00
Tally	18	Not limited		Not limited		Very limited Slope	1.00
Williams	16	Not limited		Not limited		Very limited Slope	1.00
470D:							
Zahl	31	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Beisigl	27	Somewhat limited Too sandy Slope	0.79 0.63	Somewhat limited Too sandy Slope	0.79 0.63	Very limited Slope Too sandy Depth to bedrock	1.00 0.79 0.46
Tally	15	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
490:							
Riverwash	85	Not rated		Not rated		Not rated	
496:							
Pits, gravel and sand, low precipitation	90	Not rated		Not rated		Not rated	
M-W:							
Miscellaneous water-	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Recreation - Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2:							
Heil	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Too clayey	1.00	Too clayey	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Too clayey	1.00
						Ponding	1.00
3:							
Dimmick	61	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
5:							
Tonka	52	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
Hamerly	22	Not limited		Not limited		Not limited	
7:							
Harriet	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
						Depth to saturated zone	1.00
						Flooding	0.60
9:							
Grano	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
10:							
Banks	62	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
10D:							
Seroco	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Droughty	0.58
						Slope	0.04
Lohler	10	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Flooding	0.60
11B:							
Patent	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
12:							
Trembles	77	Not limited		Not limited		Somewhat limited	
						Flooding	0.60

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
13:							
Havrelon	73	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
14:							
Channel	40	Not rated		Not rated		Not rated	
Korchea	52	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
15:							
Korchea	71	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
16:							
Ridgelawn	58	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
17:							
Lohler	93	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Flooding	0.60
19:							
Hoffmanville	74	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Flooding	0.60
20:							
Scorio	76	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Flooding	0.60
21B:							
Tally	50	Not limited		Not limited		Not limited	
Parshall	28	Not limited		Not limited		Not limited	
21C:							
Tally	61	Not limited		Not limited		Not limited	
Parshall	19	Not limited		Not limited		Not limited	
22:							
Velva	75	Not limited		Not limited		Not limited	
23B:							
Lihen	38	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.37	Too sandy	0.37		
Parshall	15	Not limited		Not limited		Not limited	
23D:							
Beisigl	41	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.79	Too sandy	0.79	Droughty	0.88
						Depth to bedrock	0.46
						Slope	0.37
Telfer	31	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Slope	0.37
						Droughty	0.21

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
24:							
Arnegard	68	Not limited		Not limited		Not limited	
25:							
Farnuf	50	Not limited		Not limited		Not limited	
25B:							
Farnuf	58	Not limited		Not limited		Not limited	
25C:							
Farnuf	67	Not limited		Not limited		Not limited	
26:							
Tansem	64	Not limited		Not limited		Not limited	
Roseglen	20	Not limited		Not limited		Not limited	
26B:							
Tansem	74	Not limited		Not limited		Not limited	
Roseglen	15	Not limited		Not limited		Not limited	
27:							
Golva	67	Not limited		Not limited		Not limited	
27B:							
Golva	62	Not limited		Not limited		Not limited	
27C:							
Golva	67	Not limited		Not limited		Not limited	
29:							
Savage	61	Not limited		Not limited		Not limited	
29B:							
Savage	67	Not limited		Not limited		Not limited	
29C:							
Savage	58	Not limited		Not limited		Not limited	
30:							
Lawther	77	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
31B:							
Cherry	76	Not limited		Not limited		Not limited	
31C:							
Cherry	68	Not limited		Not limited		Not limited	
32F:							
Cherry	20	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50				
Cabba	29	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.08	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
33:							
Belfield	49	Not limited		Not limited		Very limited	
						Sodium content	1.00
Grail	26	Not limited		Not limited		Not limited	
33B:							
Belfield	42	Not limited		Not limited		Not limited	
Savage	34	Not limited		Not limited		Not limited	
34B:							
Daglum	52	Not limited		Not limited		Very limited	
						Sodium content	1.00
Belfield	17	Not limited		Not limited		Not limited	
36B:							
Rhoades	55	Not limited		Not limited		Very limited	
						Sodium content	1.00
Daglum	33	Not limited		Not limited		Very limited	
						Sodium content	1.00
38B:							
Dogtooth	59	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
Janesburg	27	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
38F:							
Dogtooth	33	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Slope	1.00
						Sodium content	1.00
						Depth to bedrock	0.46
Janesburg	22	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Slope	1.00
						Sodium content	1.00
						Depth to bedrock	0.46
Cabba	20	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
40B:							
Desart	24	Not limited		Not limited		Very limited	
						Sodium content	1.00
Janesburg	16	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
Ekalaka	22	Not limited		Not limited		Very limited	
						Sodium content	1.00

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
41:							
Williams	47	Not limited		Not limited		Not limited	
Bowbells	37	Not limited		Not limited		Not limited	
41B:							
Williams	60	Not limited		Not limited		Not limited	
Bowbells	27	Not limited		Not limited		Not limited	
42B:							
Williams	49	Not limited		Not limited		Not limited	
Zahl	27	Not limited		Not limited		Not limited	
42C:							
Williams	58	Not limited		Not limited		Not limited	
43C:							
Williams	35	Not limited		Not limited		Not limited	
Zahl	35	Not limited		Not limited		Not limited	
44D:							
Zahl	45	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Williams	21	Not limited		Not limited		Somewhat limited	
						Slope	0.63
44E:							
Zahl	46	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
Williams	30	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
45F:							
Zahl	23	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
Cabba	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
Maschetah	17	Not limited		Not limited		Somewhat limited	
						Slope	0.04
46B:							
Dooley	41	Not limited		Not limited		Not limited	
Zahl	12	Not limited		Not limited		Not limited	
46C:							
Dooley	45	Not limited		Not limited		Not limited	
Zahl	22	Not limited		Not limited		Not limited	

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
46D:							
Dooley	31	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Zahl	25	Not limited		Not limited		Somewhat limited	
						Slope	0.63
48:							
Temvik	51	Not limited		Not limited		Not limited	
Wilton	38	Not limited		Not limited		Not limited	
49:							
Temvik	47	Not limited		Not limited		Not limited	
Williams	38	Not limited		Not limited		Not limited	
49B:							
Temvik	50	Not limited		Not limited		Not limited	
Williams	16	Not limited		Not limited		Not limited	
50B:							
Temvik	48	Not limited		Not limited		Not limited	
Zahl	26	Not limited		Not limited		Not limited	
51B:							
Amor	67	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
Shambo	15	Not limited		Not limited		Not limited	
51C:							
Amor	39	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
Cabba	29	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
51D:							
Amor	42	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.46
Cabba	29	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
						Slope	0.63
52B:							
Reeder	49	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
Farnuf	16	Not limited		Not limited		Not limited	
52C:							
Reeder	34	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
52C:(cont.)							
Cabba	16	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
53B:							
Chama	43	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
Sen	25	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
Cabba	14	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
53C:							
Chama	40	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
Cabba	28	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
Sen	17	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
53D:							
Cabba	38	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
						Slope	0.63
Chama	26	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.46
Sen	16	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.46
54F:							
Cabba	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
Sen	18	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Depth to bedrock	0.46
Chama	15	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Slope	1.00
						Depth to bedrock	0.46
55B:							
Sen	25	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
55B:(cont.)							
Janesburg	34	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
56B:							
Lefor	78	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
56C:							
Lefor	65	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
61D:							
Beisigl	42	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.79	Too sandy	0.79	Droughty	0.88
						Depth to bedrock	0.46
						Slope	0.37
Flasher	28	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.79	Too sandy	0.79	Depth to bedrock	1.00
						Droughty	1.00
						Slope	0.37
61F:							
Beisigl	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Too sandy	0.79	Slope	1.00
		Too sandy	0.79	Slope	0.56	Droughty	0.88
						Depth to bedrock	0.46
Flasher	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Too sandy	0.79	Depth to bedrock	1.00
		Too sandy	0.79	Slope	0.56	Slope	1.00
						Droughty	1.00
Tally	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.01	Too sandy	0.01	Slope	0.04
62F:							
Flasher	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Too sandy	0.79	Too sandy	0.79	Droughty	1.00
						Slope	1.00
Rock outcrop	22	Not rated		Not rated		Not rated	
Vebar	13	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.56	Slope	1.00
						Depth to bedrock	0.29
63B:							
Vebar	44	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
Flasher	12	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.79	Too sandy	0.79	Depth to bedrock	1.00
						Droughty	1.00
63C:							
Vebar	54	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
63C:(cont.)							
Flasher	10	Somewhat limited Too sandy	 0.79	Somewhat limited Too sandy	 0.79	Very limited Depth to bedrock Droughty	 1.00 1.00
63D:							
Vebar	32	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	 0.63 0.46
Flasher	16	Somewhat limited Too sandy	 0.79	Somewhat limited Too sandy	 0.79	Very limited Depth to bedrock Droughty Slope	 1.00 1.00 0.63
Tally	15	Not limited		Not limited		Somewhat limited Slope	 0.63
66B:							
Manning	66	Not limited		Not limited		Not limited	
70B:							
Regent	71	Not limited		Not limited		Somewhat limited Depth to bedrock	 0.46
Savage	15	Not limited		Not limited		Not limited	
70C:							
Regent	43	Not limited		Not limited		Somewhat limited Depth to bedrock	 0.46
Cabba	20	Not limited		Not limited		Very limited Depth to bedrock Droughty	 1.00 0.88
71B:							
Regent	38	Not limited		Not limited		Somewhat limited Depth to bedrock	 0.46
Janesburg	28	Not limited		Not limited		Very limited Sodium content Depth to bedrock	 1.00 0.46
71C:							
Regent	32	Not limited		Not limited		Somewhat limited Depth to bedrock	 0.46
Janesburg	31	Not limited		Not limited		Very limited Sodium content Depth to bedrock	 1.00 0.46
72B:							
Moreau	46	Somewhat limited Too clayey	 0.50	Somewhat limited Too clayey	 0.50	Very limited Too clayey Depth to bedrock	 1.00 0.46
72C:							
Moreau	46	Somewhat limited Too clayey	 0.50	Somewhat limited Too clayey	 0.50	Very limited Too clayey Depth to bedrock	 1.00 0.46

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
72C:(cont.)							
Wayden	17	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Depth to bedrock	1.00
						Too clayey	1.00
						Droughty	0.83
72D:							
Moreau	30	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Slope	0.63
						Depth to bedrock	0.46
Cabba	27	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
						Slope	0.63
80:							
Badland, high precipitation	90	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
83F:							
Cabba	46	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
Badland, outcrop	36	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
84F:							
Cabba	25	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.96	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
Chama	20	Somewhat limited		Not limited		Very limited	
		Slope	0.68			Slope	1.00
						Depth to bedrock	0.46
Havrelon	14	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
88D:							
Brandenburg	39	Not limited		Not limited		Very limited	
						Droughty	1.00
						Gravel content	0.59
						Slope	0.37
Searing	21	Not limited		Not limited		Not limited	

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
88D:(cont.)							
Dogtooth	12	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
						Slope	0.37
88F:							
Brandenburg	38	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	1.00
						Gravel content	0.59
Cabba	17	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
Dogtooth	12	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Sodium content	1.00
						Depth to bedrock	0.46
89F:							
Brandenburg	28	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
						Slope	1.00
						Gravel content	0.59
Cabba	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
Badland, outcrop	16	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
90E:							
Manning	24	Not limited		Not limited		Somewhat limited	
						Slope	0.16
Schaller	22	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Slope	1.00
						Droughty	0.98
Wabek	22	Somewhat limited		Not limited		Very limited	
		Slope	0.08			Droughty	1.00
						Slope	1.00
91F:							
Wabek	50	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Slope	1.00
						Droughty	0.96
Zahl	27	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Slope	1.00

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
93B:							
Lehr	37	Not limited		Not limited		Somewhat limited	
						Droughty	0.35
Stady	27	Not limited		Not limited		Not limited	
94B:							
Searing	60	Not limited		Not limited		Not limited	
Ringling	19	Not limited		Not limited		Very limited	
						Droughty	1.00
						Content of large stones	0.01
95:							
Havrelon	96	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Flooding	0.60
96:							
Pits, gravel and sand	85	Not rated		Not rated		Very limited	
						Droughty	1.00
						Gravel content	1.00
						Slope	1.00
						Too sandy	0.50
98F:							
Tinsley	53	Somewhat limited		Not limited		Very limited	
		Slope	0.68			Droughty	1.00
						Slope	1.00
						Gravel content	0.04
						Content of large stones	0.01
Chanta	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.37
99:							
Mckeen	73	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
100F:							
Boxwell	34	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	1.00	Dusty	0.50	Depth to bedrock	0.46
		Dusty	0.50	Slope	0.22		
Cabbart	32	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.50	Slope	1.00
		Dusty	0.50	Slope	0.22	Droughty	0.80
Arikara	16	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.56	Slope	1.00

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
101F:							
Cabbart	41	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Water erosion	1.00	Slope	0.96	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	0.80
Badland, outcrop	27	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
102B:							
Kremlin	26	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Ethridge	22	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Gerda	19	Not limited		Not limited		Very limited	
						Sodium content	1.00
103B:							
Chinook	42	Not limited		Not limited		Not limited	
Rhame	28	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
103D:							
Rhame	42	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
						Slope	0.37
Chinook	32	Not limited		Not limited		Somewhat limited	
						Slope	0.37
103F:							
Rhame	29	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.56	Slope	1.00
						Depth to bedrock	0.46
Fleak	27	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Too sandy	0.79	Depth to bedrock	1.00
		Too sandy	0.79	Slope	0.56	Slope	1.00
						Droughty	1.00
104E:							
Badland, outcrop	54	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Patent	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
						Slope	0.37

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
105:							
Havre	77	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
106:							
Glendive	70	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
107:							
Kremlin	77	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
108B:							
Hanly	81	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
109:							
Havre, wooded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
110B:							
Maltese	39	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
Gerda	30	Not limited		Not limited		Very limited	
						Sodium content	1.00
111D:							
Gerda	16	Not limited		Not limited		Very limited	
						Sodium content	1.00
Kirby	23	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Gravel content	0.76
						Slope	0.37
						Content of large stones	0.03
111F:							
Kirby	49	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Gravel content	0.76
						Content of large stones	0.03
Scairt	16	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.08			Sodium content	1.00
						Depth to bedrock	0.46
112F:							
Kirby	39	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Gravel content	0.76
						Content of large stones	0.03

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
112F:(cont.)							
Badland, outcrop----	23	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Patent----------	13	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.50	Slope	1.00
		Dusty	0.50			Flooding	0.60
113F:							
Lonna----------	34	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Slope	0.37
Cabbart----------	33	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Slope	0.68	Dusty	0.50	Slope	1.00
		Dusty	0.50			Droughty	0.80
114:							
Channel----------	40	Not rated		Not rated		Not rated	
Glendive----------	35	Not limited		Not limited		Not limited	
Havre----------	18	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
115F:							
Badland, outcrop----	30	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Arikara----------	28	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabbart----------	16	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	0.80
116F:							
Kremlin----------	19	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
		Dusty	0.50	Dusty	0.50		
Cabbart----------	29	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.50	Slope	1.00
		Dusty	0.50			Droughty	0.80
117:							
Wolf Point----------	85	Not limited		Not limited		Somewhat limited	
						Flooding	0.60

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
118F:							
Lonna	35	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
Kirby	34	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.50	Droughty	1.00
		Dusty	0.50	Slope	0.08	Slope	1.00
						Gravel content	0.76
						Content of large stones	0.03
Cabbart	16	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Water erosion	1.00	Dusty	0.50	Slope	1.00
		Dusty	0.50	Slope	0.08	Droughty	0.80
119F:							
Patent	33	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
						Slope	0.37
Badland, outcrop	21	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Cabbart	21	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.50	Slope	1.00
		Dusty	0.50	Slope	0.22	Droughty	0.80
121F:							
Maltese	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
						Slope	0.04
Lonna	24	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
Arikara	22	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.56	Slope	1.00
127:							
Maschetah	82	Not limited		Not limited		Not limited	
127B:							
Maschetah	87	Not limited		Not limited		Not limited	
127C:							
Maschetah	70	Not limited		Not limited		Not limited	
131B:							
Lonna	87	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
131C:							
Lonna	64	Somewhat limited Dusty	 0.50	Somewhat limited Dusty	 0.50	Very limited Sodium content	 1.00
132C:							
Patent	38	Somewhat limited Dusty	 0.50	Somewhat limited Dusty	 0.50	Somewhat limited Flooding	 0.60
Gerda	27	Not limited		Not limited		Very limited Sodium content	 1.00
Slickspots	10	Not rated		Not rated		Very limited Too clayey Flooding	 1.00 0.60
138E:							
Scairt	31	Somewhat limited Dusty	 0.50	Somewhat limited Dusty	 0.50	Very limited Sodium content Depth to bedrock Slope	 1.00 0.46 0.37
Maltese	22	Somewhat limited Dusty	 0.50	Somewhat limited Dusty	 0.50	Very limited Sodium content Slope	 1.00 0.96
Boxwell	10	Very limited Water erosion Dusty	 1.00 0.50	Very limited Water erosion Dusty	 1.00 0.50	Somewhat limited Depth to bedrock Slope	 0.46 0.37
145F:							
Zahl	23	Very limited Slope	 1.00	Somewhat limited Slope	 0.78	Very limited Slope	 1.00
Cabba	21	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Depth to bedrock Slope Droughty	 1.00 1.00 0.88
Arikara	20	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
146B:							
Dooley	60	Not limited		Not limited		Not limited	
151B:							
Boxwell	46	Somewhat limited Dusty	 0.50	Somewhat limited Dusty	 0.50	Somewhat limited Depth to bedrock	 0.46
Kremlin	43	Somewhat limited Dusty	 0.50	Somewhat limited Dusty	 0.50	Not limited	
151D:							
Boxwell	38	Very limited Water erosion Dusty	 1.00 0.50	Very limited Water erosion Dusty	 1.00 0.50	Somewhat limited Depth to bedrock Slope	 0.46 0.37
Kremlin	28	Very limited Water erosion Dusty	 1.00 0.50	Very limited Water erosion Dusty	 1.00 0.50	Somewhat limited Slope	 0.37

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
154F:							
Arikara	33	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Shambo	21	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Slope	1.00
Cabba	18	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
161F:							
Beisigl	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Too sandy	0.76	Slope	1.00
		Too sandy	0.76	Slope	0.56	Droughty	0.88
						Depth to bedrock	0.46
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Too sandy	0.37	Too sandy	0.37	Slope	1.00
						Droughty	1.00
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
164D:							
Vebar, extremely stony	80	Very limited		Very limited		Somewhat limited	
		Too stony	1.00	Too stony	1.00	Depth to bedrock	0.46
						Content of large stones	0.46
						Slope	0.04
171:							
Lohler, moderately saline	86	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Salinity	1.00
						Too clayey	1.00
						Flooding	0.60
180:							
Badland	88	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
183F:							
Badland, outcrop	51	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Cabba	32	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
187F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabbart	26	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	0.80
193B:							
Chanta	81	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
194F:							
Kirby	42	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Gravel content	0.76
						Content of large stones	0.03
Arikara	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Badland, outcrop	16	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
						Salinity	1.00
						Sodium content	1.00
195:							
Havrelon	42	Not limited		Not limited		Very limited	
						Salinity	1.00
						Flooding	0.60
						Droughty	0.01
199:							
Mckeen	78	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
						Flooding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
201F:							
Badland, outcrop	63	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Cabbart	30	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Water erosion	1.00	Slope	0.96	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	0.80

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
202D:							
Boxwell	27	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.46
		Dusty	0.50	Dusty	0.50	Slope	0.37
Scairt	18	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
						Depth to bedrock	0.46
						Slope	0.37
Maltese	14	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
						Slope	0.37
203D:							
Rhame	23	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
						Slope	0.04
Kremlin	16	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Maltese	15	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
203F:							
Rhame	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Too sandy	0.01	Slope	1.00
		Too sandy	0.01			Depth to bedrock	0.46
Scairt	22	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.50	Slope	1.00
		Dusty	0.50			Sodium content	1.00
						Depth to bedrock	0.46
Kremlin	13	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50	Dusty	0.50		
		Dusty	0.50				
205:							
Havre, rarely flooded	89	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
206:							
Glendive, rarely flooded	84	Not limited		Not limited		Not limited	
207:							
Harriet	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
						Depth to saturated zone	1.00
						Flooding	0.60
211F:							
Cabba	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
211F:(cont.)							
Badland, outcrop----	34	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Arikara----------	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
212:							
Trembles----------	70	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
213:							
Havrelon, slightly wet----------	92	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
214:							
Channel	40	Not rated		Not rated		Not rated	
Korchea, wooded-----	52	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
217:							
Wolf Point, wooded--	78	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
218F:							
Cherry----------	23	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Cabba----------	22	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
Brandenburg---------	16	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Droughty	1.00
						Slope	1.00
						Gravel content	0.59
227:							
Haydraw----------	84	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
227B:							
Haydraw----------	72	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
231C:							
Patent----------	32	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
Gullied land--------	19	Not rated		Not rated		Very limited	
						Slope	1.00
						Salinity	1.00
						Depth to bedrock	0.99
						Droughty	0.46

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
231C:(cont.)							
Glendive	13	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
232C:							
Lambert	41	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
Slickspots	21	Not rated		Not rated		Very limited	
						Too clayey	1.00
						Flooding	0.60
Rhoades	15	Not limited		Not limited		Very limited	
						Sodium content	1.00
238B:							
Janesburg	40	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
Dogtooth	29	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
239D:							
Vebar	30	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.46
						Slope	0.04
Janesburg	19	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Depth to bedrock	0.46
						Slope	0.04
242F:							
Zahl	50	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.04	Slope	1.00
Williams	20	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
Arikara	15	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Slope	1.00
287F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabba	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
299:							
Minnewaukan	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
						Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00		
		Flooding	0.40	Flooding	0.40	Ponding	1.00
		Too sandy	0.01	Too sandy	0.01	Droughty	0.21

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
299:(cont.)							
Banks	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.79	Too sandy	0.79	Flooding	0.60
						Droughty	0.01
Riverwash	30	Not rated		Not rated		Very limited	
						Flooding	1.00
						Droughty	1.00
						Depth to saturated zone	0.99
						Too sandy	0.50
317:							
Lallie	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
						Flooding	0.60
331B:							
Cherry	33	Not limited		Not limited		Not limited	
Gullied land	21	Not rated		Not rated		Very limited	
						Slope	1.00
						Salinity	1.00
						Depth to bedrock	0.99
						Droughty	0.46
Havrelon	16	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
340B:							
Niobell	42	Not limited		Not limited		Not limited	
Williams	27	Not limited		Not limited		Not limited	
341B:							
Noonan	39	Not limited		Not limited		Not limited	
Niobell	31	Not limited		Not limited		Not limited	
Williams	23	Not limited		Not limited		Not limited	
341C:							
Noonan	23	Not limited		Not limited		Not limited	
Williams	22	Not limited		Not limited		Not limited	
403F:							
Rhame	24	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.56	Slope	1.00
						Depth to bedrock	0.46
Arikara	23	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.56	Slope	1.00

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
403F:(cont.)							
Fleak	16	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Too sandy	0.79	Depth to bedrock	1.00
		Too sandy	0.79	Slope	0.56	Slope	1.00
						Droughty	1.00
404F:							
Badland, outcrop	42	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Lambert	34	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Flooding	0.60
						Slope	0.37
Cabba	12	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.88
406:							
Glendive, wooded	74	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
408B:							
Hanly, wooded	61	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
410:							
Riverwash	85	Not rated		Not rated		Very limited	
						Flooding	1.00
						Droughty	1.00
						Depth to saturated zone	0.99
						Too sandy	0.50
411B:							
Lambert	81	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
412E:							
Lambert	37	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
Brandenburg	26	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Droughty	1.00
						Slope	1.00
						Gravel content	0.59
442F:							
Zahl	50	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Slope	1.00
Williams	24	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
460C:							
Zahl	28	Not limited		Not limited		Not limited	
Williams	20	Not limited		Not limited		Not limited	
Cabba	19	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
460D:							
Zahl	32	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Cabba	24	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.88
						Slope	0.63
Williams	13	Not limited		Not limited		Somewhat limited	
						Slope	0.63
470C:							
Zahl	31	Not limited		Not limited		Not limited	
Tally	18	Not limited		Not limited		Not limited	
Williams	16	Not limited		Not limited		Not limited	
470D:							
Zahl	31	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Beisigl	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.79	Too sandy	0.79	Droughty	0.88
						Slope	0.63
						Depth to bedrock	0.46
Tally	15	Not limited		Not limited		Somewhat limited	
						Slope	0.63
490:							
Riverwash	85	Not rated		Not rated		Very limited	
						Flooding	1.00
						Droughty	1.00
						Depth to saturated zone	0.99
						Too sandy	0.50
496:							
Pits, gravel and sand, low precipitation	90	Not rated		Not rated		Very limited	
						Droughty	1.00
						Gravel content	1.00
						Slope	1.00
						Too sandy	0.50

Recreation - Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W:							
Miscellaneous water-	100	Not rated		Not rated		Not rated	
W:							
Water----------	100	Not rated		Not rated		Not rated	

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife for food and cover. They also affect the construction of water impoundments. If food, cover, or water is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area.

If the soils have potential for habitat development, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing existing plant cover, and fostering the natural establishment of desirable plants.

The soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife. It can also be used for selecting soils suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat. More detailed information is available in Section II of the electronic Field Office Technical Guide (eFOTG) at www.nrcs.usda.gov/techical/efotg.

The potential of the soil for wildlife habitat is rated **good, fair, poor** or **very poor**. A rating of **good** indicates the kind of habitat is easily established, improved, or maintained. Few or no limitations affect management and satisfactory results can be expected. A rating of **fair** indicates the kind of wildlife habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of **poor** indicates limitations are severe for the designated kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of **very poor** indicates restrictions for the element or kind of wildlife habitat are very severe and unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants used by wildlife. Examples are wheat, rye, oats, corn, beans, sunflower, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes planted for wildlife food and cover. Examples are intermediate wheatgrass, tall wheatgrass, sweetclover, and alfalfa.

Wild herbaceous plants are native grasses and forbs that provide food and cover for wildlife. Examples are big bluestem, little bluestem, blue grama, green needlegrass, western wheatgrass, and various native forbs and legumes. The major soil properties affecting the growth of grain and forage crops and wild herbaceous plants are depth of the root zone, texture of the surface layer, the amount of water available to plants, wetness, salinity or sodicity, and flooding.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage that wildlife eat. Examples are oak, poplar, boxelder, green ash, willow, and American elm.

Coniferous plants provide habitat or supply food in the form of browse, seed, or fruitlike cones. Examples are pine, spruce, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the rooting zone, available water capacity, salinity and soil moisture. Examples of shrubs are common chokecherry, buffaloberry, snowberry, juneberry, hawthorn, skunkbush sumac, silver sagebrush, American plum, and redosier dogwood.

The major soil properties affecting the growth of hardwood and coniferous trees and shrubs are depth of the root zone, the amount of water available to plants, and wetness.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Wetland plants produce food or cover for wetland wildlife. Examples of these plants are smartweed, sedges, bulrushes, white top, common reedgrass, saltgrass, prairie cordgrass, and cattail.

The major soil properties affecting wetland plants are texture of the surface layer, wetness, acidity or alkalinity, and slope.

Shallow water areas have an average depth of less than 6 feet. They are useful as habitat for many wildlife species including amphibians. They are naturally wet areas, streams, or are created by dams. Examples are wetlands occurring in natural depressions or in natural drainageways adjacent to streams, dams, dugouts, creeks, or beaver ponds.

The major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and saturated hydraulic conductivity.

Habitat for wildlife consists of cropland, pasture, rangeland, and other areas that have a cover of grasses, herbs, and/or shrubs. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include grassland nesting birds, such as Hungarian partridge, pheasant, sharptail grouse, waterfowl, mule deer, cottontail rabbits, coyote, and red fox.

Habitat for wildlife associated with wetlands consists of open, marshy or swampy, shallow water areas that support water-tolerant plants. The wildlife attracted to this habitat includes ducks, geese, shore birds, muskrat, mink, beaver, and various amphibians.

Wildlife habitat associated with woodland consists of areas of hardwoods or conifers or a mixture of these and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to this habitat includes bird species associated with woodland, tree squirrels, raccoon, turkeys, and white-tailed deer.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the "Glossary."

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The "Building Site Development" tables show the degree and kind of soil limitations that affect dwellings with and without basements and small commercial buildings in Part I; and local roads and streets, shallow excavations, and lawns and landscaping in Part II.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. **Not limited** indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. **Slightly limited** indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. **Somewhat limited** indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. **Very limited** indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of

gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

The “Sanitary Facilities” tables show the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons in Part I; and sanitary landfills, and daily cover for landfill in Part II. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. **Not limited** indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. **Slightly limited** indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. **Somewhat limited** indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. **Very limited** indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on

the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A **trench sanitary landfill** is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an **area sanitary landfill**, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

The “Construction Materials” table gives information about the soils as potential sources of gravel, sand, topsoil, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and **gravel** are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated **good, fair,** or **poor** as potential sources of sand and gravel. A rating of **good** or **fair** means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a **poor** source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated **good, fair,** or **poor** as potential sources of topsoil and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil or roadfill. The lower the number, the greater the limitation.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Water Management

The “Water Management” table gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. **Not limited** indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. **Somewhat limited** indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special

planning, design, or installation. Fair performance and moderate maintenance can be expected. **Very limited** indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Building Site Development - Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2:							
Heil	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
3:							
Dimmick	61	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
5:							
Tonka	52	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Ponding	1.00	Shrink-swell	1.00
		Ponding	1.00	Shrink-swell	0.50	Ponding	1.00
Hamerly	22	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
		Depth to saturated zone	0.01	Shrink-swell	0.50	Depth to saturated zone	0.01
7:							
Harriet	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Shrink-swell	0.50		
9:							
Grano	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
10:							
Banks	62	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.47		
10D:							
Seroco	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
Lohler	10	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
11B:							
Patent	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
12:							
Trembles	77	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
13:							
Havrelon	73	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
14:							
Channel	40	Not rated		Not rated		Not rated	
Korchea	52	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
15:							
Korchea	71	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
16:							
Ridgelawn	58	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.47		
17:							
Lohler	93	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		
19:							
Hoffmanville	74	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		
20:							
Scorio	76	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		
21B:							
Tally	50	Not limited		Not limited		Not limited	
Parshall	28	Not limited		Not limited		Not limited	

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21C:							
Tally	61	Not limited		Not limited		Somewhat limited Slope	0.88
Parshall	19	Not limited		Not limited		Somewhat limited Slope	0.88
22:							
Velva	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
23B:							
Lihen	38	Not limited		Not limited		Not limited	
Parshall	15	Not limited		Not limited		Not limited	
23D:							
Beisigl	41	Somewhat limited Slope	0.37	Somewhat limited Depth to soft bedrock Slope	0.46 0.37	Very limited Slope	1.00
Telfer	31	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
24:							
Arnegard	68	Not limited		Not limited		Not limited	
25:							
Farnuf	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
25B:							
Farnuf	58	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
25C:							
Farnuf	67	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Very limited Slope Shrink-swell	1.00 0.50
26:							
Tansem	64	Somewhat limited Shrink-swell	0.50	Not limited		Somewhat limited Shrink-swell	0.50
Roseglen	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
26B:							
Tansem	74	Somewhat limited Shrink-swell	0.50	Not limited		Somewhat limited Shrink-swell Slope	0.50 0.12
Roseglen	15	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
27:							
Golva	67	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B:							
Golva	62	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
27C:							
Golva	67	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
29:							
Savage	61	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
29B:							
Savage	67	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
29C:							
Savage	58	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	1.00
30:							
Lawther	77	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
31B:							
Cherry	76	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
31C:							
Cherry	68	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
32F:							
Cherry	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Cabba	29	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
33:							
Belfield	49	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		
Grail	26	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		
33B:							
Belfield	42	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.16		

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
33B:(cont.)							
Savage	34	Very limited Shrink-swell	 1.00	Very limited Shrink-swell	 1.00	Very limited Shrink-swell	 1.00
34B:							
Daglum	52	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to saturated zone	 1.00 0.47	Very limited Shrink-swell	 1.00
Belfield	17	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to saturated zone	 1.00 0.47	Very limited Shrink-swell	 1.00
36B:							
Rhoades	55	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to saturated zone	 1.00 0.47	Very limited Shrink-swell	 1.00
Daglum	33	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to saturated zone	 1.00 0.47	Very limited Shrink-swell	 1.00
38B:							
Dogtooth	59	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Not limited	
Janesburg	27	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Not limited	
38F:							
Dogtooth	33	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.46	Very limited Slope	 1.00
Janesburg	22	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.46	Very limited Slope	 1.00
Cabba	20	Very limited Depth to soft bedrock Slope	 1.00 1.00	Very limited Depth to soft bedrock Slope	 1.00 1.00	Very limited Slope Depth to soft bedrock	 1.00 1.00
40B:							
Desart	24	Not limited		Not limited		Not limited	
Janesburg	16	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Not limited	
Ekalaka	22	Not limited		Not limited		Not limited	

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
41:							
Williams	47	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Bowbells	37	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.47		
41B:							
Williams	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Bowbells	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.47	Slope	0.12
42B:							
Williams	49	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Zahl	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
42C:							
Williams	58	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
43C:							
Williams	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Zahl	35	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
44D:							
Zahl	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Williams	21	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
44E:							
Zahl	46	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Williams	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
45F:							
Zahl	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Cabba	21	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
Maschetah	17	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.04	Slope	0.04	Shrink-swell	0.50
46B:							
Dooley	41	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Zahl	12	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
46C:							
Dooley	45	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
Zahl	22	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
46D:							
Dooley	31	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Zahl	25	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
48:							
Temvik	51	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Wilton	38	Not limited		Somewhat limited		Not limited	
				Shrink-swell	0.50		
49:							
Temvik	47	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Williams	38	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
49B:							
Temvik	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
49B:(cont.)							
Williams	16	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell Slope	 0.50 0.12
50B:							
Temvik	48	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell Slope	 0.50 0.12
Zahl	26	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell Slope	 0.50 0.12
51B:							
Amor	67	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Somewhat limited Slope	 0.12
Shambo	15	Not limited		Not limited		Somewhat limited Slope	 0.12
51C:							
Amor	39	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Very limited Slope	 1.00
Cabba	29	Somewhat limited Depth to soft bedrock	 1.00	Very limited Depth to soft bedrock	 1.00	Very limited Depth to soft bedrock Slope	 1.00 1.00
51D:							
Amor	42	Somewhat limited Slope	 0.63	Somewhat limited Slope Depth to soft bedrock	 0.63 0.46	Very limited Slope	 1.00
Cabba	29	Somewhat limited Depth to soft bedrock Slope	 1.00 0.63	Very limited Depth to soft bedrock Slope	 1.00 0.63	Very limited Slope Depth to soft bedrock	 1.00 1.00
52B:							
Reeder	49	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell Depth to soft bedrock	 0.50 0.46	Somewhat limited Shrink-swell Slope	 0.50 0.12
Farnuf	16	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell Slope	 0.50 0.12
52C:							
Reeder	34	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell Depth to soft bedrock	 0.50 0.46	Very limited Slope Shrink-swell	 1.00 0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
52C:(cont.)							
Cabba	16	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
53B:							
Chama	43	Not limited		Somewhat limited Depth to soft bedrock	0.46	Somewhat limited Slope	0.12
Sen	25	Not limited		Somewhat limited Depth to soft bedrock	0.46	Somewhat limited Slope	0.12
Cabba	14	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.12
53C:							
Chama	40	Not limited		Somewhat limited Depth to soft bedrock	0.46	Very limited Slope	1.00
Cabba	28	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Sen	17	Not limited		Somewhat limited Depth to soft bedrock	0.46	Very limited Slope	1.00
53D:							
Cabba	38	Somewhat limited Depth to soft bedrock Slope	1.00 0.63	Very limited Depth to soft bedrock Slope	1.00 0.63	Very limited Slope Depth to soft bedrock	1.00 1.00
Chama	26	Somewhat limited Slope	0.63	Somewhat limited Slope Depth to soft bedrock	0.63 0.46	Very limited Slope	1.00
Sen	16	Somewhat limited Slope	0.63	Somewhat limited Slope Depth to soft bedrock	0.63 0.46	Very limited Slope	1.00
54F:							
Cabba	45	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Sen	18	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.46	Very limited Slope	1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
54F:(cont.)							
Chama	15	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.46	Very limited Slope	 1.00
55B:							
Sen	25	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Not limited	
Janesburg	34	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Not limited	
56B:							
Lefor	78	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Not limited	
56C:							
Lefor	65	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Very limited Slope	 1.00
61D:							
Beisigl	42	Somewhat limited Slope	 0.37	Somewhat limited Depth to soft bedrock Slope	 0.46 0.37	Very limited Slope	 1.00
Flasher	28	Somewhat limited Depth to soft bedrock Slope	 1.00 0.37	Very limited Depth to soft bedrock Slope	 1.00 0.37	Very limited Depth to soft bedrock Slope	 1.00 1.00
61F:							
Beisigl	35	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.46	Very limited Slope	 1.00
Flasher	30	Very limited Slope Depth to soft bedrock	 1.00 1.00	Very limited Slope Depth to soft bedrock	 1.00 1.00	Very limited Slope Depth to soft bedrock	 1.00 1.00
Tally	17	Somewhat limited Slope	 0.04	Somewhat limited Slope	 0.04	Very limited Slope	 1.00
62F:							
Flasher	35	Very limited Depth to soft bedrock Slope	 1.00 1.00	Very limited Depth to soft bedrock Slope	 1.00 1.00	Very limited Slope Depth to soft bedrock	 1.00 1.00
Rock outcrop	22	Not rated		Not rated		Not rated	

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
62F:(cont.)							
Vebar	13	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.29	Very limited Slope	 1.00
63B:							
Vebar	44	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Somewhat limited Slope	 0.12
Flasher	12	Somewhat limited Depth to soft bedrock	 1.00	Very limited Depth to soft bedrock	 1.00	Somewhat limited Depth to soft bedrock Slope	 1.00 0.12
63C:							
Vebar	54	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Very limited Slope	 1.00
Flasher	10	Somewhat limited Depth to soft bedrock	 1.00	Very limited Depth to soft bedrock	 1.00	Very limited Depth to soft bedrock Slope	 1.00 1.00
63D:							
Vebar	32	Somewhat limited Slope	 0.63	Somewhat limited Slope Depth to soft bedrock	 0.63 0.46	Very limited Slope	 1.00
Flasher	16	Somewhat limited Depth to soft bedrock Slope	 1.00 0.63	Very limited Depth to soft bedrock Slope	 1.00 0.63	Very limited Slope Depth to soft bedrock	 1.00 1.00
Tally	15	Somewhat limited Slope	 0.63	Somewhat limited Slope	 0.63	Very limited Slope	 1.00
66B:							
Manning	66	Not limited		Not limited		Not limited	
70B:							
Regent	71	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to soft bedrock	 1.00 0.46	Very limited Shrink-swell Slope	 1.00 0.12
Savage	15	Very limited Shrink-swell	 1.00	Very limited Shrink-swell	 1.00	Very limited Shrink-swell	 1.00
70C:							
Regent	43	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to soft bedrock	 1.00 0.46	Very limited Shrink-swell Slope	 1.00 1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70C:(cont.)							
Cabba	20	Somewhat limited Depth to soft bedrock	 1.00	Very limited Depth to soft bedrock	 1.00	Very limited Depth to soft bedrock Slope	 1.00 1.00
71B:							
Regent	38	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to soft bedrock	 1.00 0.46	Very limited Shrink-swell	 1.00
Janesburg	28	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Not limited	
71C:							
Regent	32	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to soft bedrock	 1.00 0.46	Very limited Shrink-swell Slope	 1.00 1.00
Janesburg	31	Not limited		Somewhat limited Depth to soft bedrock	 0.46	Very limited Slope	 1.00
72B:							
Moreau	46	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to soft bedrock	 1.00 0.46	Very limited Shrink-swell	 1.00
72C:							
Moreau	46	Very limited Shrink-swell	 1.00	Very limited Shrink-swell Depth to soft bedrock	 1.00 0.46	Very limited Shrink-swell Slope	 1.00 1.00
Wayden	17	Very limited Depth to soft bedrock Shrink-swell	 1.00 1.00	Very limited Shrink-swell Depth to soft bedrock	 1.00 1.00	Very limited Depth to soft bedrock Shrink-swell Slope	 1.00 1.00 1.00
72D:							
Moreau	30	Very limited Shrink-swell Slope	 1.00 0.63	Very limited Shrink-swell Slope Depth to soft bedrock	 1.00 0.63 0.46	Very limited Slope Shrink-swell	 1.00 1.00
Cabba	27	Somewhat limited Depth to soft bedrock Slope	 1.00 0.63	Very limited Depth to soft bedrock Slope	 1.00 0.63	Very limited Slope Depth to soft bedrock	 1.00 1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
80:							
Badland, high precipitation	90	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope		Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
83F:							
Cabba	46	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
Badland, outcrop	36	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
84F:							
Cabba	25	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Chama	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.46		
Havrelon	14	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
88D:							
Brandenburg	39	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
		Content of large stones	0.09	Content of large stones	0.09	Content of large stones	0.09
Searing	21	Not limited		Not limited		Very limited	
						Slope	1.00
Dogtooth	12	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.37		
88F:							
Brandenburg	38	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.09	Content of large stones	0.09	Content of large stones	0.09
Cabba	17	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
88F:(cont.)							
Dogtooth	12	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.46	Very limited Slope	 1.00
89F:							
Brandenburg	28	Very limited Slope Content of large stones	 1.00 0.09	Very limited Slope Content of large stones	 1.00 0.09	Very limited Slope Content of large stones	 1.00 0.09
Cabba	22	Very limited Depth to soft bedrock Slope	 1.00 1.00	Very limited Depth to soft bedrock Slope	 1.00 1.00	Very limited Slope Depth to soft bedrock	 1.00 1.00
Badland, outcrop	16	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.99	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 1.00	Very limited Slope Depth to soft bedrock Shrink-swell	 1.00 1.00 0.99
90E:							
Manning	24	Somewhat limited Slope	 0.16	Somewhat limited Slope	 0.16	Very limited Slope	 1.00
Schaller	22	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
Wabek	22	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
91F:							
Wabek	50	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
Zahl	27	Very limited Slope Shrink-swell	 1.00 0.50	Very limited Slope Shrink-swell	 1.00 0.50	Very limited Slope Shrink-swell	 1.00 0.50
93B:							
Lehr	37	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50
Stady	27	Not limited		Not limited		Not limited	
94B:							
Searing	60	Not limited		Not limited		Not limited	
Ringling	19	Not limited		Not limited		Not limited	
95:							
Havrelon	96	Very limited Flooding Shrink-swell	 1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	 1.00 0.50 0.47	Very limited Flooding Shrink-swell	 1.00 0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
96:							
Pits, gravel and sand	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
98F:							
Tinsley	53	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Chanta	17	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
99:							
Mckeen	73	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
100F:							
Boxwell	34	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.46		
Cabbart	32	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Arikara	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
101F:							
Cabbart	41	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Badland, outcrop	27	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
102B:							
Kremlin	26	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Ethridge	22	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
Gerda	19	Very limited		Not limited		Very limited	
		Shrink-swell	1.00			Shrink-swell	1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
103B:							
Chinook	42	Not limited		Not limited		Not limited	
Rhame	28	Not limited		Somewhat limited Depth to soft bedrock	0.46	Not limited	
103D:							
Rhame	42	Somewhat limited Slope	0.37	Somewhat limited Depth to soft bedrock Slope	0.46 0.37	Very limited Slope	1.00
Chinook	32	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
103F:							
Rhame	29	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.46	Very limited Slope	1.00
Fleak	27	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
104E:							
Badland, outcrop	54	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.99	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 1.00	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.99
Patent	25	Very limited Flooding Shrink-swell Slope	1.00 0.50 0.37	Very limited Flooding Shrink-swell Slope	1.00 0.50 0.37	Very limited Flooding Slope Shrink-swell	1.00 1.00 0.50
105:							
Havre	77	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
106:							
Glendive	70	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
107:							
Kremlin	77	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
108B:							
Hanly	81	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
109:							
Havre, wooded	80	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.15	Very limited Flooding	1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
110B:							
Maltese	39	Very limited Shrink-swell	 1.00	Somewhat limited Shrink-swell	 0.50	Very limited Shrink-swell	 1.00
Gerda	30	Very limited Shrink-swell	 1.00	Not limited		Very limited Shrink-swell	 1.00
111D:							
Gerda	16	Very limited Shrink-swell	 1.00	Not limited		Very limited Shrink-swell Slope	 1.00 0.12
Kirby	23	Somewhat limited Slope Content of large stones	 0.37 0.01	Somewhat limited Slope Content of large stones	 0.37 0.01	Very limited Slope Content of large stones	 1.00 0.01
111F:							
Kirby	49	Very limited Slope Content of large stones	 1.00 0.01	Very limited Slope Content of large stones	 1.00 0.01	Very limited Slope Content of large stones	 1.00 0.01
Scairt	16	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.46	Very limited Slope	 1.00
112F:							
Kirby	39	Very limited Slope Content of large stones	 1.00 0.01	Very limited Slope Content of large stones	 1.00 0.01	Very limited Slope Content of large stones	 1.00 0.01
Badland, outcrop	23	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.99	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 1.00	Very limited Slope Depth to soft bedrock Shrink-swell	 1.00 1.00 0.99
Patent	13	Very limited Slope Flooding Shrink-swell	 1.00 1.00 0.50	Very limited Slope Flooding Shrink-swell	 1.00 1.00 0.50	Very limited Slope Flooding Shrink-swell	 1.00 1.00 0.50
113F:							
Lonna	34	Somewhat limited Shrink-swell Slope	 0.50 0.37	Somewhat limited Shrink-swell Slope	 0.50 0.37	Very limited Slope Shrink-swell	 1.00 0.50
Cabbart	33	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50
114:							
Channel	40	Not rated		Not rated		Not rated	
Glendive	35	Very limited Flooding	 1.00	Very limited Flooding	 1.00	Very limited Flooding	 1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
114:(cont.)							
Havre	18	Very limited Flooding	 1.00	Very limited Flooding	 1.00	Very limited Flooding	 1.00
115F:							
Badland, outcrop	30	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.99	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 1.00	Very limited Slope Depth to soft bedrock Shrink-swell	 1.00 1.00 0.99
Arikara	28	Very limited Slope Shrink-swell	 1.00 0.50	Very limited Slope Shrink-swell	 1.00 0.50	Very limited Slope Shrink-swell	 1.00 0.50
Cabbart	16	Very limited Slope Depth to soft bedrock Shrink-swell	 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	 1.00 1.00 0.50
116F:							
Kremlin	19	Somewhat limited Slope Shrink-swell	 0.63 0.50	Somewhat limited Slope Shrink-swell	 0.63 0.50	Very limited Slope Shrink-swell	 1.00 0.50
Cabbart	29	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	 1.00 1.00 0.50
117:							
Wolf Point	85	Very limited Flooding Shrink-swell	 1.00 1.00	Very limited Flooding Shrink-swell	 1.00 1.00	Very limited Flooding Shrink-swell	 1.00 1.00
118F:							
Lonna	35	Very limited Slope Shrink-swell	 1.00 0.50	Very limited Slope Shrink-swell	 1.00 0.50	Very limited Slope Shrink-swell	 1.00 0.50
Kirby	34	Very limited Slope Content of large stones	 1.00 0.01	Very limited Slope Content of large stones	 1.00 0.01	Very limited Slope Content of large stones	 1.00 0.01
Cabbart	16	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	 1.00 1.00 0.50
119F:							
Patent	33	Very limited Flooding Shrink-swell Slope	 1.00 0.50 0.37	Very limited Flooding Shrink-swell Slope	 1.00 0.50 0.37	Very limited Flooding Slope Shrink-swell	 1.00 1.00 0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
119F:(cont.)							
Badland, outcrop----	21	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
Cabbart----------	21	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
121F:							
Maltese----------	25	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
		Slope	0.04	Slope	0.04	Slope	1.00
Lonna----------	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Arikara----------	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
127:							
Maschetah----------	82	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
127B:							
Maschetah----------	87	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
127C:							
Maschetah----------	70	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
131B:							
Lonna----------	87	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
131C:							
Lonna----------	64	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
132C:							
Patent----------	38	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Gerda----------	27	Very limited		Not limited		Very limited	
		Shrink-swell	1.00			Shrink-swell	1.00
						Slope	0.12
Slickspots----------	10	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.99	Shrink-swell	0.99	Shrink-swell	0.99

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
138E:							
Scairt	31	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.37		
Maltese	22	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Slope	0.96	Shrink-swell	1.00
		Slope	0.96	Shrink-swell	0.50	Slope	1.00
Boxwell	10	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.37		
145F:							
Zahl	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Cabba	21	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
Arikara	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
146B:							
Dooley	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
151B:							
Boxwell	46	Not limited		Somewhat limited		Not limited	
				Depth to soft bedrock	0.46		
Kremlin	43	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
151D:							
Boxwell	38	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.37		
Kremlin	28	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
154F:							
Arikara	33	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Shambo	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
154F:(cont.)							
Cabba	18	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
161F:							
Beisigl	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.46		
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
164D:							
Vebar, extremely stony	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.04		
171:							
Lohler, moderately saline	86	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		
180:							
Badland	88	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
183F:							
Badland, outcrop	51	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
Cabba	32	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
187F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
187F:(cont.)							
Cabbart	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
193B:							
Chanta	81	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
194F:							
Kirby	42	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.01	Content of large stones	0.01	Content of large stones	0.01
Arikara	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Badland, outcrop	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
195:							
Havrelon, saline	42	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.47		
199:							
Mckeen	78	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
201F:							
Badland, outcrop	63	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
Cabbart	30	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
202D:							
Boxwell	27	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.37		

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
202D:(cont.)							
Scairt	18	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.37		
Maltese	14	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
203D:							
Rhame	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.04		
Kremlin	16	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
Maltese	15	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
						Slope	0.12
203F:							
Rhame	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.46		
Scairt	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.46		
Kremlin	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
205:							
Havre, rarely flooded	89	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
206:							
Glendive, rarely flooded	84	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
207:							
Harriet	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Shrink-swell	0.50		
211F:							
Cabba	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
211F:(cont.)							
Badland, outcrop----	34	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
Arikara----------	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
212:							
Trembles----------	70	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.47		
213:							
Havrelon, slightly wet----------	92	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.47		
214:							
Channel----------	40	Not Rated		Not Rated		Not Rated	
Korchea, wooded-----	52	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
217:							
Wolf Point, wooded--	78	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.15		
218F:							
Cherry----------	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Cabba----------	22	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to soft bedrock	1.00
Brandenburg---------	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.09	Content of large stones	0.09	Content of large stones	0.09
227:							
Haydraw----------	84	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
227B:							
Haydraw----------	72	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
231C:							
Patent	32	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Gullied land	19	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to soft bedrock	0.99	Shrink-swell	0.50
				Shrink-swell	0.50		
Glendive	13	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
232C:							
Lambert	41	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Slickspots	21	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.99	Shrink-swell	0.99	Shrink-swell	0.99
Rhoades	15	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.16		
238B:							
Janesburg	40	Not limited		Somewhat limited		Not limited	
				Depth to soft bedrock	0.46		
Dogtooth	29	Not limited		Somewhat limited		Not limited	
				Depth to soft bedrock	0.46		
239D:							
Vebar	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.04		
Janesburg	19	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.04		
242F:							
Zahl	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Williams	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
242F:(cont.)							
Arikara	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
287F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Cabba	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
299:							
Minnewaukan	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
Banks	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Riverwash	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
317:							
Lallie	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
331B:							
Cherry	33	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Gullied land	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to soft bedrock	0.99	Shrink-swell	0.50
				Shrink-swell	0.50		
Havrelon	16	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
340B:							
Niobell	42	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
				Depth to saturated zone	0.47		
Williams	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
341B:							
Noonan	39	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Niobell	31	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Williams	23	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
341C:							
Noonan	23	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Very limited Slope Shrink-swell	1.00 0.50
Williams	22	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Very limited Slope Shrink-swell	1.00 0.50
403F:							
Rhame	24	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.46	Very limited Slope	1.00
Arikara	23	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Fleak	16	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
404F:							
Badland, outcrop	42	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.99	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 1.00	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.99
Lambert	34	Very limited Flooding Shrink-swell Slope	1.00 0.50 0.37	Very limited Flooding Shrink-swell Slope	1.00 0.50 0.37	Very limited Flooding Slope Shrink-swell	1.00 1.00 0.50
Cabba	12	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
406:							
Glendive, wooded	74	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.15	Very limited Flooding	1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
408B:							
Hanly, wooded-------	61	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.15		
410:							
Riverwash----------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
411B:							
Lambert------------	81	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
412E:							
Lambert------------	37	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Brandenburg---------	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.09	Content of large stones	0.09	Content of large stones	0.09
442F:							
Zahl----------------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Williams------------	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
460C:							
Zahl----------------	28	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
Williams------------	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Cabba---------------	19	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
						Slope	1.00
460D:							
Zahl----------------	32	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Cabba---------------	24	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to soft bedrock	1.00

Building Site Development - Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
460D:(cont.)							
Williams	13	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
470C:							
Zahl	31	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
Tally	18	Not limited		Not limited		Very limited	
						Slope	1.00
Williams	16	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
470D:							
Zahl	31	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Beisigl	27	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.46		
Tally	15	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
490:							
Riverwash	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
496:							
Pits, gravel and sand, low precipitation	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
M-W:							
Miscellaneous water	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Building Site Development - Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2:							
Heil	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Ponding	1.00	Too clayey	1.00
		Ponding	1.00	Too clayey	0.50	Ponding	1.00
		Frost action	0.50				
3:							
Dimmick	61	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Too clayey	0.50		
		Frost action	0.50	Cutbanks cave	0.10		
5:							
Tonka	52	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Ponding	1.00				
Hamerly	22	Very limited		Very limited		Not limited	
		Frost action	1.00	Depth to saturated zone	0.99		
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
7:							
Harriet	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Frost action	1.00	Flooding	0.60	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	0.10	Flooding	0.60
9:							
Grano	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Cutbanks cave	1.00	Ponding	1.00
		Shrink-swell	1.00	Ponding	1.00		
		Ponding	1.00	Too clayey	0.88		
10:							
Banks	62	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Flooding	0.60		
				Depth to saturated zone	0.47		
10D:							
Seroco	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.04	Cutbanks cave	1.00	Droughty	0.58
				Slope	0.04	Slope	0.04

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D:(cont.)							
Lohler	10	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.60	Too clayey	1.00
		Shrink-swell	1.00	Too clayey	0.50	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.47		
				Cutbanks cave	0.10		
11B:							
Patent	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
12:							
Trembles	77	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
13:							
Havrelon	73	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
14:							
Channel	40	Not rated		Not rated		Not rated	
Korchea	52	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
15:							
Korchea	71	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
16:							
Ridgelawn	58	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Shrink-swell	0.50	Flooding	0.60		
		Frost action	0.50	Depth to saturated zone	0.47		
17:							
Lohler	93	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.60	Too clayey	1.00
		Shrink-swell	1.00	Too clayey	0.50	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.47		
				Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
19:							
Hoffmanville	74	Very limited		Very limited		Very limited	
		Flooding	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Shrink-swell	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.47		
				Too clayey	0.12		
20:							
Scorio	76	Very limited		Very limited		Very limited	
		Flooding	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Shrink-swell	1.00	Flooding	0.60	Flooding	0.60
				Depth to saturated zone	0.47		
				Too clayey	0.28		
21B:							
Tally	50	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Parshall	28	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
21C:							
Tally	61	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Parshall	19	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
22:							
Velva	75	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40				
23B:							
Lihen	38	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
Parshall	15	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
23D:							
Beisigl	41	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Cutbanks cave	1.00	Droughty	0.88
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Slope	0.37	Slope	0.37
Telfer	31	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Cutbanks cave	1.00	Slope	0.37
				Slope	0.37	Droughty	0.21
24:							
Arnegard	68	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
25:							
Farnuf	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
25B:							
Farnuf	58	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
25C:							
Farnuf	67	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
26:							
Tansem	64	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Roseglen	20	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
26B:							
Tansem	74	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Roseglen	15	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
27:							
Golva	67	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
27B:							
Golva	62	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
27C:							
Golva	67	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
29:							
Savage	61	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
29B:							
Savage	67	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
29C:							
Savage	58	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
30:							
Lawther	77	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
				Too clayey	0.50		
31B:							
Cherry	76	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
31C:							
Cherry	68	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
32F:							
Cherry	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Cabba	29	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	bedrock		Slope	1.00
				Slope	1.00	Droughty	0.88
		Low strength	0.78	Cutbanks cave	0.10		
		Frost action	0.50				
33:							
Belfield	49	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Depth to	0.47	Sodium content	1.00
		Low strength	1.00	saturated zone			
				Cutbanks cave	0.10		
Grail	26	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to	0.47		
		Low strength	1.00	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
33B:							
Belfield	42	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to	0.16		
		Low strength	1.00	saturated zone			
				Cutbanks cave	0.10		
Savage	34	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
34B:							
Daglum	52	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Depth to saturated zone	0.47	Sodium content	1.00
		Shrink-swell	1.00				
		Frost action	0.50	Cutbanks cave	0.10		
Belfield	17	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to saturated zone	0.47		
		Low strength	1.00	Cutbanks cave	0.10		
36B:							
Rhoades	55	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	0.47	Sodium content	1.00
		Low strength	1.00	Cutbanks cave	0.10		
				Too clayey	0.02		
Daglum	33	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Depth to saturated zone	0.47	Sodium content	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
38B:							
Dogtooth	59	Not limited		Somewhat limited		Very limited	
				Depth to soft bedrock	0.46	Sodium content	1.00
						Depth to bedrock	0.46
				Cutbanks cave	0.10		
Janesburg	27	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
38F:							
Dogtooth	33	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.46	Sodium content	1.00
						Depth to bedrock	0.46
				Cutbanks cave	0.10		
Janesburg	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Cabba	20	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
40B:							
Desart	24	Somewhat limited		Very limited		Very limited	
		Frost action	0.50	Cutbanks cave	1.00	Sodium content	1.00

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40B:(cont.)							
Janesburg	16	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Ekalaka	22	Somewhat limited		Very limited		Very limited	
		Frost action	0.50	Cutbanks cave	1.00	Sodium content	1.00
41:							
Williams	47	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Bowbells	37	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.47		
		Shrink-swell	0.50				
		Frost action	0.50	Cutbanks cave	0.10		
41B:							
Williams	60	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Bowbells	27	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.47		
		Shrink-swell	0.50				
		Frost action	0.50	Cutbanks cave	0.10		
42B:							
Williams	49	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Zahl	27	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
42C:							
Williams	58	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
43C:							
Williams	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Zahl	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
44D:							
Zahl	45	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Williams	21	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
44E:							
Zahl	46	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Williams	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
45F:							
Zahl	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cabba	21	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
Maschetah	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.04
		Frost action	0.50	Slope	0.04		
		Slope	0.04				
46B:							
Dooley	41	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Zahl	12	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
46C:							
Dooley	45	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
46C:(cont.)							
Zahl	22	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
46D:							
Dooley	31	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Zahl	25	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
48:							
Temvik	51	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Wilton	38	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
49:							
Temvik	47	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Williams	38	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
49B:							
Temvik	50	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Williams	16	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
50B:							
Temvik	48	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Zahl	26	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
51B:							
Amor	67	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Low strength	0.22	Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
51B:(cont.)							
Shambo	15	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
51C:							
Amor	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Low strength	0.22	Cutbanks cave	0.10		
Cabba	29	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
51D:							
Amor	42	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Low strength	0.22	Cutbanks cave	0.10		
Cabba	29	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Slope	0.63	Droughty	0.88
		Slope	0.63	Cutbanks cave	0.10	Slope	0.63
		Frost action	0.50				
52B:							
Reeder	49	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Farnuf	16	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
52C:							
Reeder	34	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Cabba	16	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
53B:							
Chama	43	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
53B:(cont.)							
Sen	25	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
Cabba	14	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
53C:							
Chama	40	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
Cabba	28	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
Sen	17	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
53D:							
Cabba	38	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Slope	0.63	Droughty	0.88
		Slope	0.63	Cutbanks cave	0.10	Slope	0.63
		Frost action	0.50				
Chama	26	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
Sen	16	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
54F:							
Cabba	45	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
54F:(cont.)							
Sen	18	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
Chama	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
55B:							
Sen	25	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
Janesburg	34	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
56B:							
Lefor	78	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
56C:							
Lefor	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
61D:							
Beisigl	42	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Cutbanks cave	1.00	Droughty	0.88
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Slope	0.37	Slope	0.37
Flasher	28	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	0.37	Slope	0.37	Droughty	1.00
				Cutbanks cave	0.10	Slope	0.37
61F:							
Beisigl	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	1.00	Droughty	0.88
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	1.00

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
61F:(cont.)							
Tally	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	0.10	Slope	0.04
		Slope	0.04	Slope	0.04		
62F:							
Flasher	35	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10		
Rock outcrop	22	Not rated		Not rated		Not rated	
Vebar	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.29	Depth to bedrock	0.29
				Cutbanks cave	0.10		
63B:							
Vebar	44	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Flasher	12	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
				Cutbanks cave	0.10		
63C:							
Vebar	54	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Flasher	10	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
				Cutbanks cave	0.10		
63D:							
Vebar	32	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Flasher	16	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
				Cutbanks cave	0.10		
Tally	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
66B:							
Manning	66	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
70B:							
Regent	71	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.50	Depth to bedrock	0.46
		Shrink-swell	1.00	Depth to soft bedrock	0.46		
				Cutbanks cave	0.10		
Savage	15	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
70C:							
Regent	43	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.50	Depth to bedrock	0.46
		Shrink-swell	1.00	Depth to soft bedrock	0.46		
				Cutbanks cave	0.10		
Cabba	20	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
71B:							
Regent	38	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.50	Depth to bedrock	0.46
		Shrink-swell	1.00	Depth to soft bedrock	0.46		
				Cutbanks cave	0.10		
Janesburg	28	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
71C:							
Regent	32	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.50	Depth to bedrock	0.46
		Shrink-swell	1.00	Depth to soft bedrock	0.46		
				Cutbanks cave	0.10		
Janesburg	31	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
72B:							
Moreau	46	Very limited		Very limited		Very limited	
		Low strength	1.00	Too clayey	1.00	Too clayey	1.00
		Shrink-swell	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
72C:							
Moreau	46	Very limited		Very limited		Very limited	
		Low strength	1.00	Too clayey	1.00	Too clayey	1.00
		Shrink-swell	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Wayden	17	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	1.00	Too clayey	1.00	Too clayey	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Droughty	0.83
72D:							
Moreau	30	Very limited		Very limited		Very limited	
		Low strength	1.00	Too clayey	1.00	Too clayey	1.00
		Shrink-swell	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Cabba	27	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Slope	0.63	Droughty	0.88
		Slope	0.63	Cutbanks cave	0.10	Slope	0.63
		Frost action	0.50				
80:							
Badland, high precipitation	90	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
83F:							
Cabba	46	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
Badland, outcrop	36	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
84F:							
Cabba	25	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
84F:(cont.)							
Chama	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
Havrelon	14	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
88D:							
Brandenburg	39	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Droughty	1.00
		Content of large stones	0.09	Cutbanks cave	0.10	Gravel content	0.59
				Content of large stones	0.09	Slope	0.37
Searing	21	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Dogtooth	12	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Sodium content	1.00
						Depth to bedrock	0.46
				Slope	0.37	Slope	0.37
				Cutbanks cave	0.10		
88F:							
Brandenburg	38	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.09	Cutbanks cave	0.10	Droughty	1.00
				Content of large stones	0.09	Gravel content	0.59
Cabba	17	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.88
		Shrink-swell	0.50				
		Frost action	0.50				
Dogtooth	12	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.46	Sodium content	1.00
						Depth to bedrock	0.46
				Cutbanks cave	0.10		
89F:							
Brandenburg	28	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Content of large stones	0.09	Cutbanks cave	0.10	Slope	1.00
				Content of large stones	0.09	Gravel content	0.59

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
89F:(cont.)							
Cabba	22	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
Badland, outcrop	16	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
90E:							
Manning	24	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Cutbanks cave	1.00	Slope	0.16
				Slope	0.16		
Schaller	22	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
				Slope	1.00	Droughty	0.98
Wabek	22	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Droughty	1.00
				Slope	1.00	Slope	1.00
91F:							
Wabek	50	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
				Slope	1.00	Droughty	0.96
Zahl	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
93B:							
Lehr	37	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Cutbanks cave	1.00	Droughty	0.35
Stady	27	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
94B:							
Searing	60	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Ringling	19	Not limited		Somewhat limited		Very limited	
				Cutbanks cave	0.10	Droughty	1.00
						Content of large stones	0.01

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
95:							
Havrelon	96	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.60	Too clayey	1.00
		Low strength	1.00	Depth to saturated zone	0.47	Flooding	0.60
		Shrink-swell	0.50				
		Frost action	0.50	Cutbanks cave	0.10		
96:							
Pits, gravel and sand	85	Not rated		Not rated		Very limited	
						Droughty	1.00
						Gravel content	1.00
						Slope	1.00
						Too sandy	0.50
98F:							
Tinsley	53	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Droughty	1.00
				Slope	1.00	Slope	1.00
						Gravel content	0.04
						Content of large stones	0.01
Chanta	17	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	1.00	Slope	0.37
		Shrink-swell	0.50	Slope	0.37		
		Frost action	0.50				
		Slope	0.37				
99:							
Mckeen	73	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.80		
		Low strength	0.78				
		Shrink-swell	0.50				
100F:							
Boxwell	34	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Cabbart	32	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
Arikara	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
101F:							
Cabbart	41	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
Badland, outcrop	27	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
102B:							
Kremlin	26	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Ethridge	22	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Cutbanks cave	0.10		
Gerda	19	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Too clayey	0.12	Sodium content	1.00
				Cutbanks cave	0.10		
103B:							
Chinook	42	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Rhame	28	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
103D:							
Rhame	42	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Slope	0.37	Slope	0.37	Slope	0.37
				Cutbanks cave	0.10		
Chinook	32	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
				Cutbanks cave	0.10		
103F:							
Rhame	29	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Fleak	27	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	1.00

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
104E:							
Badland, outcrop----	54	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Patent----------	25	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Slope	0.37	Slope	0.37
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Slope	0.37				
105:							
Havre----------	77	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Cutbanks cave	0.10		
106:							
Glendive----------	70	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
107:							
Kremlin----------	77	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
108B:							
Hanly----------	81	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Flooding	0.60		
109:							
Havre, wooded-------	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.15		
				Cutbanks cave	0.10		
110B:							
Maltese----------	39	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.12	Sodium content	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Gerda----------	30	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.12	Sodium content	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10		
111D:							
Gerda----------	16	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Too clayey	0.12	Sodium content	1.00
				Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
111D:(cont.)							
Kirby	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Droughty	1.00
		Content of large stones	0.01	Cutbanks cave	0.10	Gravel content	0.76
				Content of large stones	0.01	Slope	0.37
						Content of large stones	0.03
111F:							
Kirby	49	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Content of large stones	0.01	Cutbanks cave	0.10	Slope	1.00
				Content of large stones	0.01	Gravel content	0.76
						Content of large stones	0.03
Scairt	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
112F:							
Kirby	39	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Content of large stones	0.01	Cutbanks cave	0.10	Slope	1.00
				Content of large stones	0.01	Gravel content	0.76
						Content of large stones	0.03
Badland, outcrop	23	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Patent	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
113F:							
Lonna	34	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Slope	0.37	Sodium content	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.37
		Frost action	0.50				
		Slope	0.37				
Cabbart	33	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
114:							
Channel	40	Not rated		Not rated		Not rated	
Glendive	35	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
		Flooding	0.40				
Havre	18	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40				
115F:							
Badland, outcrop	30	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Arikara	28	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cabbart	16	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
116F:							
Kremlin	19	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cabbart	29	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
117:							
Wolf Point	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
118F:							
Lonna	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	0.50				
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
118F:(cont.)							
Kirby	34	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Content of large stones	0.01	Cutbanks cave	0.10	Slope	1.00
				Content of large stones	0.01	Gravel content	0.76
						Content of large stones	0.03
Cabbart	16	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
119F:							
Patent	33	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Slope	0.37	Slope	0.37
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Slope	0.37				
Badland, outcrop	21	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Cabbart	21	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
121F:							
Maltese	25	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Too clayey	0.12	Sodium content	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	0.04
		Slope	0.04	Slope	0.04		
Lonna	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	0.50				
		Frost action	0.50				
Arikara	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
127:							
Maschetah	82	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
127B:							
Maschetah	87	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
127C:							
Maschetah	70	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
131B:							
Lonna	87	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	0.50				
		Frost action	0.50				
131C:							
Lonna	64	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	0.50				
		Frost action	0.50				
132C:							
Patent	38	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Gerda	27	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Too clayey	0.12	Sodium content	1.00
				Cutbanks cave	0.10		
Slickspots	10	Not rated		Not rated		Very limited	
						Too clayey	1.00
						Flooding	0.60
138E:							
Scairt	31	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
						Slope	0.37
				Slope	0.37		
				Cutbanks cave	0.10		
Maltese	22	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Slope	0.96	Sodium content	1.00
		Slope	0.96	Too clayey	0.12	Slope	0.96
		Frost action	0.50	Cutbanks cave	0.10		
Boxwell	10	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Slope	0.37			Slope	0.37
				Slope	0.37		
				Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
145F:							
Zahl	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cabba	21	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
Arikara	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
146B:							
Dooley	60	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
151B:							
Boxwell	46	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Kremlin	43	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
151D:							
Boxwell	38	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Slope	0.37	Slope	0.37	Slope	0.37
				Cutbanks cave	0.10		
Kremlin	28	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Slope	0.37	Slope	0.37
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Slope	0.37				
154F:							
Arikara	33	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Shambo	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
154F:(cont.)							
Cabba	18	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10	Droughty	0.88
		Shrink-swell	0.50				
		Frost action	0.50				
161F:							
Beisigl	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	1.00	Droughty	0.88
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	1.00
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
164D:							
Vebar, extremely stony	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Slope	0.04	Cutbanks cave	0.10	Content of large stones	0.46
				Slope	0.04	Slope	0.04
171:							
Lohler, moderately saline	86	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.60	Salinity	1.00
		Shrink-swell	1.00	Too clayey	0.50	Too clayey	1.00
		Frost action	0.50	Depth to saturated zone	0.47	Flooding	0.60
				Cutbanks cave	0.10		
180:							
Badland	88	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
183F:							
Badland, outcrop	51	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
183F:(cont.)							
Cabba	32	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
187F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cabbart	26	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
193B:							
Chanta	81	Very limited		Very limited		Not limited	
		Low strength	1.00	Cutbanks cave	1.00		
		Shrink-swell	0.50				
		Frost action	0.50				
194F:							
Kirby	42	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.01	Cutbanks cave	0.10	Droughty	1.00
				Content of large stones	0.01	Gravel content	0.76
						Content of large stones	0.03
Arikara	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Badland, outcrop	16	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
						Salinity	1.00
						Sodium content	1.00
195:							
Havrelon	42	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.60	Salinity	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.47	Flooding	0.60
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.01

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
199:							
Mckeen	78	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.80		
		Low strength	0.78				
201F:							
Badland, outcrop	63	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Cabbart	30	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.80
		Shrink-swell	0.50				
		Frost action	0.50				
202D:							
Boxwell	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Slope	0.37	Slope	0.37	Slope	0.37
				Cutbanks cave	0.10		
Scairt	18	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Slope	0.37	Slope	0.37
				Cutbanks cave	0.10		
Maltese	14	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Slope	0.37	Sodium content	1.00
		Frost action	0.50	Too clayey	0.12	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
203D:							
Rhame	23	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Slope	0.04	Cutbanks cave	0.10	Slope	0.04
				Slope	0.04		
Kremlin	16	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Maltese	15	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Too clayey	0.12	Sodium content	1.00
		Frost action	0.50	Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
203F:							
Rhame	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Scairt	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Kremlin	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
205:							
Havre, rarely flooded	89	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40				
206:							
Glendive, rarely flooded	84	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
		Flooding	0.40				
207:							
Harriet	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Frost action	1.00	Flooding	0.60	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	0.10	Flooding	0.60
211F:							
Cabba	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
Badland, outcrop	34	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
212:							
Trembles	70	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
				Depth to saturated zone	0.47		
213:							
Havrelon, slightly wet	92	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Depth to saturated zone	0.47		
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
214:							
Channel	40	Not rated		Not rated		Not rated	
Korchea, wooded	52	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
217:							
Wolf Point, wooded	78	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Depth to saturated zone	0.15		
		Shrink-swell	1.00	Too clayey	0.12		
				Cutbanks cave	0.10		
218F:							
Cherry	23	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Cabba	22	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
Brandenburg	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Content of large stones	0.09	Cutbanks cave	0.10	Slope	1.00
				Content of large stones	0.09	Gravel content	0.59
227:							
Haydraw	84	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
227B:							
Haydraw	72	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
231C:							
Patent	32	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Gullied land	19	Not rated		Not rated		Very limited	
						Slope	1.00
						Salinity	1.00
						Depth to bedrock	0.99
						Droughty	0.46
Glendive	13	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
232C:							
Lambert	41	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Slickspots	21	Not rated		Not rated		Very limited	
						Too clayey	1.00
						Flooding	0.60
Rhoades	15	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	0.16	Sodium content	1.00
		Low strength	1.00	Cutbanks cave	0.10		
				Too clayey	0.02		
238B:							
Janesburg	40	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Dogtooth	29	Not limited		Somewhat limited		Very limited	
				Depth to soft bedrock	0.46	Sodium content	1.00
				Cutbanks cave	0.10	Depth to bedrock	0.46
239D:							
Vebar	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Slope	0.04	Cutbanks cave	0.10	Slope	0.04
				Slope	0.04		
Janesburg	19	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Too clayey	0.50	Sodium content	1.00
		Slope	0.04	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10	Slope	0.04
				Slope	0.04		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
242F:							
Zahl	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Williams	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Arikara	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
287F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cabba	26	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
299:							
Minnewaukan	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Frost action	0.50	Flooding	0.80	Droughty	0.21
Banks	30	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Flooding	0.60	Droughty	0.01
Riverwash	30	Not rated		Not rated		Very limited	
						Flooding	1.00
						Droughty	1.00
						Depth to saturated zone	0.99
						Too sandy	0.50
317:							
Lallie	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Too clayey	1.00
		Flooding	1.00	Flooding	0.60	Ponding	1.00
		Low strength	1.00	Cutbanks cave	0.10	Flooding	0.60
		Shrink-swell	1.00	Too clayey	0.02		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
331B:							
Cherry	33	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Gullied land	21	Not rated		Not rated		Very limited	
						Slope	1.00
						Salinity	1.00
						Depth to bedrock	0.99
						Droughty	0.46
Havrelon	16	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
340B:							
Niobell	42	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to saturated zone	0.47		
		Frost action	0.50	Cutbanks cave	0.10		
Williams	27	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
341B:							
Noonan	39	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.47		
		shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Niobell	31	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to saturated zone	0.47		
		Frost action	0.50	Cutbanks cave	0.10		
Williams	23	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
341C:							
Noonan	23	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Williams	22	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
403F:							
Rhame	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
403F:(cont.)							
Arikara	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Fleak	16	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	1.00
404F:							
Badland, outcrop	42	Not rated		Not rated		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Salinity	1.00
						Sodium content	1.00
Lambert	34	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Slope	0.37	Slope	0.37
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Slope	0.37				
Cabba	12	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
406:							
Glendive, wooded	74	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
				Depth to saturated zone	0.15		
408B:							
Hanly, wooded	61	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Flooding	0.60		
				Depth to saturated zone	0.15		
410:							
Riverwash	85	Not rated		Not rated		Very limited	
						Flooding	1.00
						Droughty	1.00
						Depth to saturated zone	0.99
						Too sandy	0.50

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
411B:							
Lambert	81	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
412E:							
Lambert	37	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Brandenburg	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Droughty	1.00
		Content of large stones	0.09	Cutbanks cave	0.10	Slope	1.00
				Content of large stones	0.09	Gravel content	0.59
442F:							
Zahl	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Williams	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
460C:							
Zahl	28	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Williams	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cabba	19	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Cutbanks cave	0.10	Droughty	0.88
		Frost action	0.50				
460D:							
Zahl	32	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
460D:(cont.)							
Cabba	24	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Slope	0.63	Droughty	0.88
		Slope	0.63	Cutbanks cave	0.10	Slope	0.63
		Frost action	0.50				
Williams	13	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
470C:							
Zahl	31	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Tally	18	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Williams	16	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
470D:							
Zahl	31	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Beisigl	27	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Cutbanks cave	1.00	Droughty	0.88
				Slope	0.63	Slope	0.63
				Depth to soft bedrock	0.46	Depth to bedrock	0.46
Tally	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Cutbanks cave	0.10		
490:							
Riverwash	85	Not rated		Not rated		Very limited	
						Flooding	1.00
						Droughty	1.00
						Depth to saturated zone	0.99
						Too sandy	0.50
496:							
Pits, gravel and sand, low precipitation	90	Not rated		Not rated		Very limited	
						Droughty	1.00
						Gravel content	1.00
						Slope	1.00
						Too sandy	0.50

Building Site Development - Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W:							
Miscellaneous water-	100	Not rated		Not rated		Not rated	
W:							
Water----------	100	Not rated		Not rated		Not rated	

Sanitary Facilities - Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2:					
Heil	65	Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Seepage	0.18
3:					
Dimmick	61	Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
5:					
Tonka	52	Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Seepage	0.53
Hamerly	22	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Seepage	0.50
7:					
Harriet	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.53
9:					
Grano	50	Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
10:					
Banks	62	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
10D:					
Seroco	90	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	1.00
		Slope	0.04		
Lohler	10	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
11B:					
Patent	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Seepage	0.53
				Slope	0.32
12:					
Trembles	77	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage	1.00	Seepage	1.00
13:					
Havrelon	73	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
14:					
Channel	40	Not rated		Not rated	
Korchea	52	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
15:					
Korchea	71	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
16:					
Ridgelawn	58	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
		Restricted permeability	0.46		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
17:					
Lohler	93	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
19:					
Hoffmanville	74	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
20:					
Scorio	76	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage	1.00	Seepage	1.00
		Depth to saturated zone	0.94	Depth to saturated zone	0.40
21B:					
Tally	50	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	0.08
Parshall	28	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.08
21C:					
Tally	61	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	1.00
Parshall	19	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	1.00
22:					
Velva	75	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
23B:					
Lihen	38	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.08
Parshall	15	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.08

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
23D:					
Beisigl	41	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	0.37	Slope	1.00
Telfer	31	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	1.00
		Slope	0.37		
24:					
Arnegard	68	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
25:					
Farnuf	50	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
25B:					
Farnuf	58	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.32
25C:					
Farnuf	67	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
26:					
Tansem	64	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
Roseglen	20	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
26B:					
Tansem	74	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Slope	0.68
				Seepage	0.53
Roseglen	15	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Slope	0.68
				Seepage	0.53
27:					
Golva	67	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
27B:					
Golva	62	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
				Slope	0.32

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
27C:					
Golva	67	Somewhat limited		Very limited	
		Restricted permeability	0.46	Slope	1.00
				Seepage	0.53
29:					
Savage	61	Very limited		Not limited	
		Restricted permeability	1.00		
29B:					
Savage	67	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.32
29C:					
Savage	58	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
30:					
Lawther	77	Very limited		Not limited	
		Restricted permeability	1.00		
31B:					
Cherry	76	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.08
31C:					
Cherry	68	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
32F:					
Cherry	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00		
Cabba	29	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
33:					
Belfield	49	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
Grail	26	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
33B:					
Belfield	42	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.32
		Depth to saturated zone	0.43		
Savage	34	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.32
34B:					
Daglum	52	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94	Seepage	0.28
Belfield	17	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
36B:					
Rhoades	55	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.94	Depth to saturated zone	0.40
		Restricted permeability	0.81	Seepage	0.19
Daglum	33	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94	Seepage	0.19
38B:					
Dogtooth	59	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	0.08
Janesburg	27	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Seepage	0.22
				Slope	0.08
38F:					
Dogtooth	33	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
38F:(cont.)					
Janesburg	22	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00	Seepage	0.22
Cabba	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
40B:					
Desart	24	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.08
Janesburg	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Seepage	0.22
				Slope	0.08
Ekalaka	22	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	0.08
41:					
Williams	47	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
Bowbells	37	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
		Depth to saturated zone	0.94	Depth to saturated zone	0.40
41B:					
Williams	60	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.68
				Seepage	0.50
Bowbells	27	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.68
				Seepage	0.50
		Depth to saturated zone	0.94	Depth to saturated zone	0.40
42B:					
Williams	49	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.68
				Seepage	0.50
Zahl	27	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.68
				Seepage	0.50

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
42C:					
Williams	58	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
43C:					
Williams	35	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
Zahl	35	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
44D:					
Zahl	45	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
		Slope	0.63		
Williams	21	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
		Slope	0.63		
44E:					
Zahl	46	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Seepage	0.50
Williams	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Seepage	0.50
45F:					
Zahl	23	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
		Slope	1.00		
Cabba	21	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00		
				Slope	1.00
				Seepage	0.53
Maschetah	17	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.04		
46B:					
Dooley	41	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
				Slope	0.68
Zahl	12	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.68
				Seepage	0.50

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
46C:					
Dooley	45	Very limited Restricted permeability	1.00	Very limited Seepage Slope	1.00 1.00
Zahl	22	Very limited Restricted permeability	1.00	Very limited Slope Seepage	1.00 0.50
46D:					
Dooley	31	Very limited Restricted permeability Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00
Zahl	25	Very limited Restricted permeability Slope	1.00 0.63	Very limited Slope Seepage	1.00 0.50
48:					
Temvik	51	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.50
Wilton	38	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.50
49:					
Temvik	47	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.50
Williams	38	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.50
49B:					
Temvik	50	Very limited Restricted permeability	1.00	Somewhat limited Slope Seepage	0.68 0.50
Williams	16	Very limited Restricted permeability	1.00	Somewhat limited Slope Seepage	0.68 0.50
50B:					
Temvik	48	Very limited Restricted permeability	1.00	Somewhat limited Slope Seepage	0.68 0.50
Zahl	26	Very limited Restricted permeability	1.00	Somewhat limited Slope Seepage	0.68 0.50

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
51B:					
Amor	67	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.68
				Seepage	0.53
Shambo	15	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Slope	0.68
				Seepage	0.53
51C:					
Amor	39	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53
Cabba	29	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53
51D:					
Amor	42	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
				Seepage	0.53
Cabba	29	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
				Seepage	0.53
52B:					
Reeder	49	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.68
				Seepage	0.50
Farnuf	16	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.68
				Seepage	0.50
52C:					
Reeder	34	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.50
Cabba	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
53B:					
Chama	43	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.68
				Seepage	0.53
Sen	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.68
				Seepage	0.53
Cabba	14	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.68
				Seepage	0.53
53C:					
Chama	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53
Cabba	28	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53
Sen	17	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53
53D:					
Cabba	38	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
				Seepage	0.53
Chama	26	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
				Seepage	0.53
Sen	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
				Seepage	0.53

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
54F:					
Cabba	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Sen	18	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Chama	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
55B:					
Sen	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Seepage	0.53
				Slope	0.08
Janesburg	34	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Seepage	0.22
				Slope	0.08
56B:					
Lefor	78	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.46	Seepage	1.00
				Slope	0.08
56C:					
Lefor	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.46	Seepage	1.00
				Slope	1.00
61D:					
Beisigl	42	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	0.37	Slope	1.00
Flasher	28	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Seepage	0.18
		Slope	0.37		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
61F:					
Beisigl	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Flasher	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.18
		Seepage	1.00		
Tally	17	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Slope	0.04	Slope	1.00
62F:					
Flasher	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Seepage	0.18
		Slope	1.00		
Rock outcrop	22	Not rated		Not rated	
Vebar	13	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00		
63B:					
Vebar	44	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
				Slope	0.68
Flasher	12	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	0.68
		Seepage	1.00	Seepage	0.18
63C:					
Vebar	54	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
				Slope	1.00
Flasher	10	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Seepage	0.18

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
63D:					
Vebar	32	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
Flasher	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Seepage	0.18
		Slope	0.63		
Tally	15	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
66B:					
Manning	66	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.08
70B:					
Regent	71	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.68
Savage	15	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.32
70C:					
Regent	43	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
Cabba	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53
71B:					
Regent	38	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.08
Janesburg	28	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Seepage	0.22
				Slope	0.08

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
71C:					
Regent	32	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
Janesburg	31	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.22
72B:					
Moreau	46	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.08
72C:					
Moreau	46	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
Wayden	17	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
72D:					
Moreau	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
Cabba	27	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
				Seepage	0.53
80:					
Badland, high precipitation	90	Not rated		Very limited	
				Depth to soft bedrock	1.00
				Slope	1.00
83F:					
Cabba	46	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Badland, outcrop	36	Not rated		Very limited	
				Depth to soft bedrock	1.00
				Slope	1.00

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
84F:					
Cabba	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Chama	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Havrelon	14	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Slope	0.68
				Seepage	0.50
88D:					
Brandenburg	39	Very limited		Very limited	
		Filtering capacity	1.00	Content of large stones	1.00
		Seepage	1.00	Seepage	1.00
		Slope	0.37	Slope	1.00
		Content of large stones	0.09		
Searing	21	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	1.00
Dogtooth	12	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
		Slope	0.37		
88F:					
Brandenburg	38	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Content of large stones	1.00
		Seepage	1.00	Seepage	1.00
		Content of large stones	0.09		
Cabba	17	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Dogtooth	12	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
89F:					
Brandenburg	28	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Content of large stones	1.00
		Slope	1.00	Seepage	1.00
		Content of large stones	0.09		
Cabba	22	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Badland, outcrop	16	Not rated		Very limited	
				Depth to soft bedrock	1.00
				Slope	1.00
90E:					
Manning	24	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	1.00
		Slope	0.16		
Schaller	22	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	1.00
		Slope	1.00		
Wabek	22	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00		
91F:					
Wabek	50	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00		
Zahl	27	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00	Seepage	0.50
93B:					
Lehr	37	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	0.08

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
93B:(cont.)					
Stady	27	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.08
		Restricted permeability	0.46		
94B:					
Searing	60	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	0.08
Ringling	19	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Content of large stones	0.55
				Slope	0.32
95:					
Havrelon	96	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.94	Seepage	0.50
		Restricted permeability	0.50	Depth to saturated zone	0.40
96:					
Pits, gravel and sand	85	Not rated		Very limited	
				Seepage	1.00
				Slope	1.00
98F:					
Tinsley	53	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
				Content of large stones	0.06
Chanta	17	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.37	Slope	1.00
99:					
Mckeen	73	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Seepage	1.00
100F:					
Boxwell	34	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.46	Seepage	0.53

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
100F:(cont.)					
Cabbart	32	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Arikara	16	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
101F:					
Cabbart	41	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Badland, outcrop	27	Not rated		Not rated	
102B:					
Kremlin	26	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
				Slope	0.32
Ethridge	22	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.32
Gerda	19	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Restricted permeability	0.72	Slope	0.08
103B:					
Chinook	42	Not limited		Very limited	
				Seepage	1.00
				Slope	0.32
Rhame	28	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Seepage	1.00
				Slope	0.32
103D:					
Rhame	42	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.37	Seepage	1.00
				Slope	1.00
Chinook	32	Somewhat limited		Very limited	
		Slope	0.37	Seepage	1.00
				Slope	1.00

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
103F:					
Rhame	29	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Fleak	27	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
104E:					
Badland, outcrop	54	Not rated		Not rated	
Patent	25	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Slope	1.00
		Slope	0.37	Seepage	0.53
105:					
Havre	77	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Seepage	0.53
106:					
Glendive	70	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
				Seepage	1.00
107:					
Kremlin	77	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
108B:					
Hanly	81	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.08
109:					
Havre, wooded	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Seepage	0.53
		Depth to saturated zone	0.40		
110B:					
Maltese	39	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.08

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
110B:(cont.)					
Gerda	30	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Restricted permeability	0.72	Slope	0.08
111D:					
Gerda	16	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Restricted permeability	0.72	Slope	0.68
Kirby	23	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.37	Slope	1.00
		Content of large stones	0.01	Content of large stones	0.74
111F:					
Kirby	49	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Content of large stones	0.01	Content of large stones	0.74
Scairt	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00		
112F:					
Kirby	39	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Content of large stones	0.01	Content of large stones	0.74
Badland, outcrop	23	Not rated		Not rated	
Patent	13	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.46	Seepage	0.53
113F:					
Lonna	34	Somewhat limited		Very limited	
		Restricted permeability	0.46	Slope	1.00
		Slope	0.37	Seepage	0.53
Cabbart	33	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
114:					
Channel	40	Not rated		Not rated	
Glendive	35	Somewhat limited		Very limited	
		Flooding	0.40	Seepage	1.00
				Flooding	0.40
Havre	18	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
		Flooding	0.40	Flooding	0.40
115F:					
Badland, outcrop	30	Not rated		Not rated	
Arikara	28	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
Cabbart	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
116F:					
Kremlin	19	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Restricted permeability	0.46	Seepage	0.53
Cabbart	29	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
117:					
Wolf Point	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00		
118F:					
Lonna	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.46	Seepage	0.53
Kirby	34	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
		Content of large stones	0.01	Content of large stones	0.74

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
118F:(cont.)					
Cabbart	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
119F:					
Patent	33	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Slope	1.00
		Slope	0.37	Seepage	0.53
Badland, outcrop	21	Not rated		Not rated	
Cabbart	21	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
121F:					
Maltese	25	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Slope	0.04		
Lonna	24	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.46	Seepage	0.53
Arikara	22	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
127:					
Maschetah	82	Very limited		Not limited	
		Restricted permeability	1.00		
127B:					
Maschetah	87	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.32
127C:					
Maschetah	70	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
131B:					
Lonna	87	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
				Slope	0.32

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
131C:					
Lonna	64	Somewhat limited		Very limited	
		Restricted permeability	0.46	Slope	1.00
				Seepage	0.53
132C:					
Patent	38	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Slope	0.68
				Seepage	0.53
Gerda	27	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Restricted permeability	0.72	Slope	0.68
Slickspots	10	Not rated		Very limited	
				Flooding	1.00
				Slope	0.32
				Seepage	0.18
138E:					
Scairt	31	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
		Slope	0.37		
Maltese	22	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Slope	0.96		
Boxwell	10	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.46	Slope	1.00
		Slope	0.37	Seepage	0.53
145F:					
Zahl	23	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00	Seepage	0.50
Cabba	21	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
Arikara	20	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
146B:					
Dooley	60	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
				Slope	0.08
151B:					
Boxwell	46	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.46	Seepage	0.53
				Slope	0.32
Kremlin	43	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
				Slope	0.32
151D:					
Boxwell	38	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.46	Slope	1.00
		Slope	0.37	Seepage	0.53
Kremlin	28	Somewhat limited		Very limited	
		Restricted permeability	0.46	Slope	1.00
		Slope	0.37	Seepage	0.53
154F:					
Arikara	33	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
Shambo	21	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.46	Seepage	0.53
Cabba	18	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
161F:					
Beisigl	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Flasher	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.50
		Seepage	1.00		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
161F:(cont.)					
Arikara	24	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
164D:					
Vebar, extremely stony	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	0.04	Slope	1.00
171:					
Lohler, moderately saline	86	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
180:					
Badland	88	Not rated		Not rated	
183F:					
Badland, outcrop	51	Not rated		Very limited	
				Depth to soft bedrock	1.00
				Slope	1.00
Cabba	32	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
187F:					
Arikara	70	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
Cabbart	26	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
193B:					
Chanta	81	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.08

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
194F:					
Kirby	42	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
				Seepage	1.00
		Slope	1.00	Content of large stones	0.74
		Content of large stones	0.01		
Arikara	27	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
				Seepage	0.53
		Slope	1.00		
		Restricted permeability	0.46		
Badland, outcrop	16	Not rated		Not rated	
195:					
Havrelon	42	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
199:					
Mckeen	78	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Seepage	1.00
201F:					
Badland, outcrop	63	Not rated		Not rated	
Cabbart	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00		
				Slope	1.00
				Seepage	0.53
202D:					
Boxwell	27	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.46		
				Slope	1.00
		Slope	0.37	Seepage	0.53
Scairt	18	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00		
				Slope	1.00
		Slope	0.37		
Maltese	14	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	1.00
		Seepage	1.00		
		Slope	0.37		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
203D:					
Rhame	23	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.04	Seepage	1.00
				Slope	1.00
Kremlin	16	Somewhat limited		Very limited	
		Restricted permeability	0.46	Slope	1.00
				Seepage	0.53
Maltese	15	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
		Seepage	1.00	Slope	0.68
203F:					
Rhame	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Scairt	22	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00		
Kremlin	13	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.46	Seepage	0.53
205:					
Havre, rarely flooded	89	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
		Flooding	0.40	Flooding	0.40
206:					
Glendive, rarely flooded	84	Somewhat limited		Very limited	
		Flooding	0.40	Seepage	1.00
				Flooding	0.40
207:					
Harriet	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.53
211F:					
Cabba	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
211F:(cont.)					
Badland, outcrop	34	Not rated		Very limited	
				Depth to soft bedrock	1.00
				Slope	1.00
Arikara	24	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
212:					
Trembles	70	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage	1.00	Seepage	1.00
		Depth to saturated zone	0.94	Depth to saturated zone	0.40
213:					
Havrelon, slightly wet	92	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.94	Seepage	0.50
		Restricted permeability	0.50	Depth to saturated zone	0.40
214:					
Channel	40	Not rated		Not rated	
Korchea, wooded	52	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
217:					
Wolf Point, wooded	78	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00		
		Depth to saturated zone	0.40		
218F:					
Cherry	23	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.63		
Cabba	22	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00		
				Slope	1.00
				Seepage	0.53

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
218F:(cont.)					
Brandenburg	16	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Seepage	1.00	Content of large stones	1.00
		Slope	1.00	Seepage	1.00
		Content of large stones	0.09		
227:					
Haydraw	84	Very limited		Not limited	
		Restricted permeability	1.00		
227B:					
Haydraw	72	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.32
231C:					
Patent	32	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Slope	0.68
				Seepage	0.53
Gullied land	19	Not rated		Not rated	
Glendive	13	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
				Seepage	1.00
				Slope	0.08
232C:					
Lambert	41	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Slope	0.68
				Seepage	0.53
Slickspots	21	Not rated		Very limited	
				Flooding	1.00
				Seepage	0.18
				Slope	0.08
Rhoades	15	Somewhat limited		Somewhat limited	
		Restricted permeability	0.81	Slope	0.32
				Seepage	0.19
		Depth to saturated zone	0.43		
238B:					
Janesburg	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00		
				Seepage	0.22
				Slope	0.08
Dogtooth	29	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00		
				Slope	0.08

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
239D:					
Vebar	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00		
		Slope	0.04	Seepage	1.00
				Slope	1.00
Janesburg	19	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
		Slope	0.04	Seepage	0.22
242F:					
Zahl	50	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00	Seepage	0.50
Williams	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Seepage	0.50
Arikara	15	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
287F:					
Arikara	70	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
Cabba	26	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
299:					
Minnewaukan	40	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Ponding	1.00
		Ponding	1.00		
Banks	30	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage	1.00		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
299:(cont.)					
Riverwash	30	Not rated		Very limited	
				Flooding	1.00
				Seepage	1.00
				Depth to saturated zone	1.00
317:					
Lallie	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
331B:					
Cherry	33	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.08
Gullied land	21	Not rated		Not rated	
Havrelon	16	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.08
340B:					
Niobell	42	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94	Slope	0.08
Williams	27	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.08
341B:					
Noonan	39	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94	Slope	0.08
Niobell	31	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94	Slope	0.08
Williams	23	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.08
341C:					
Noonan	23	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
341C:(cont.)					
Williams	22	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
403F:					
Rhame	24	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Arikara	23	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
		Restricted permeability	0.46		
Fleak	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
404F:					
Badland, outcrop	42	Not rated		Very limited	
				Depth to soft bedrock	1.00
				Slope	1.00
Lambert	34	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.46	Slope	1.00
		Slope	0.37	Seepage	0.53
Cabba	12	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.53
406:					
Glendive, wooded	74	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.40	Seepage	1.00
408B:					
Hanly, wooded	61	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.08
		Depth to saturated zone	0.40		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
410:					
Riverwash	85	Not rated		Very limited	
				Flooding	1.00
				Seepage	1.00
				Depth to saturated zone	1.00
411B:					
Lambert	81	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Slope	0.08
412E:					
Lambert	37	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Slope	0.32
Brandenburg	26	Very limited		Very limited	
		Filtering capacity	1.00	Content of large stones	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
		Content of large stones	0.09		
442F:					
Zahl	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Seepage	0.50
Williams	24	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Seepage	0.50
460C:					
Zahl	28	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
Williams	20	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
Cabba	19	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.53
460D:					
Zahl	32	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
		Slope	0.63		

Sanitary Facilities - Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
460D:(cont.)					
Cabba	24	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
				Seepage	0.53
Williams	13	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
		Slope	0.63		
470C:					
Zahl	31	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
Tally	18	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	1.00
Williams	16	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
470D:					
Zahl	31	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
		Slope	0.63		
Beisigl	27	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00		
		Slope	0.63	Slope	1.00
				Seepage	1.00
Tally	15	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
490:					
Riverwash	85	Not rated		Not rated	
496:					
Pits, gravel and sand, low precipitation	90	Not rated		Very limited	
				Seepage	1.00
				Slope	1.00
M-W:					
Miscellaneous water-	100	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Sanitary Facilities - Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2:							
Heil	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Ponding	1.00	Too clayey	1.00
		Sodium content	1.00			Hard to compact	1.00
		Ponding	1.00			Sodium content	1.00
						Ponding	1.00
3:							
Dimmick	61	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Ponding	1.00	Too clayey	1.00
		Ponding	1.00			Hard to compact	1.00
						Ponding	1.00
5:							
Tonka	52	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Hard to compact	1.00
		Too clayey	0.50			Ponding	1.00
						Too clayey	0.50
Hamerly	22	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.50
7:							
Harriet	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Sodium content	1.00				
9:							
Grano	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Ponding	1.00	Too clayey	1.00
		Ponding	1.00			Hard to compact	1.00
						Ponding	1.00
10:							
Banks	62	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
		Seepage	1.00	Seepage	1.00		
		Too sandy	0.50				

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D:							
Seroco	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	0.04	Seepage	1.00
		Slope	0.04			Slope	0.04
Lohler	10	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00				
11B:							
Patent	80	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
12:							
Trembles	77	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.21
		Seepage	1.00	Seepage	1.00		
13:							
Havrelon	73	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Too clayey	0.50				
14:							
Channel	40	Not rated		Not rated		Not rated	
Korchea	52	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
15:							
Korchea	71	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
16:							
Ridgelawn	58	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Seepage	1.00	Seepage	1.00		
17:							
Lohler	93	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00				
19:							
Hoffmanville	74	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Hard to compact	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Seepage	1.00	Seepage	1.00		
		Too clayey	0.50				

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
20:							
Scorio	76	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00	Seepage	1.00		
		Seepage	1.00				
21B:							
Tally	50	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.50
Parshall	28	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.52
21C:							
Tally	61	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.50
Parshall	19	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.52
22:							
Velva	75	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.21
		Flooding	0.40	Flooding	0.40		
23B:							
Lihen	38	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00			Seepage	1.00
Parshall	15	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.52
23D:							
Beisigl	41	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	1.00
		Too sandy	0.50	Slope	0.37	Too sandy	0.50
		Slope	0.37			Slope	0.37
Telfer	31	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	0.37	Seepage	1.00
		Slope	0.37			Slope	0.37
24:							
Arnegard	68	Not limited		Not limited		Not limited	
25:							
Farnuf	50	Not limited		Not limited		Not limited	
25B:							
Farnuf	58	Not limited		Not limited		Not limited	
25C:							
Farnuf	67	Not limited		Not limited		Not limited	

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
26:							
Tansem	64	Not limited		Not limited		Not limited	
Roseglen	20	Not limited		Not limited		Not limited	
26B:							
Tansem	74	Not limited		Not limited		Not limited	
Roseglen	15	Not limited		Not limited		Not limited	
27:							
Golva	67	Not limited		Not limited		Not limited	
27B:							
Golva	62	Not limited		Not limited		Not limited	
27C:							
Golva	67	Not limited		Not limited		Not limited	
29:							
Savage	61	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
29B:							
Savage	67	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
29C:							
Savage	58	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
30:							
Lawther	77	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
31B:							
Cherry	76	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
31C:							
Cherry	68	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
32F:							
Cherry	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Cabba	29	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
33:							
Belfield	49	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Sodium content	1.00			Sodium content	1.00
		Too clayey	0.50			Too clayey	0.50
Grail	26	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
33B:							
Belfield	42	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
Savage	34	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
34B:							
Daglum	52	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Sodium content	1.00			Sodium content	1.00
		Too clayey	0.50			Too clayey	0.50
Belfield	17	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
36B:							
Rhoades	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Sodium content	1.00
		Sodium content	1.00				
Daglum	33	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Sodium content	1.00			Sodium content	1.00
		Too clayey	0.50			Too clayey	0.50
38B:							
Dogtooth	59	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00
Janesburg	27	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
38F:							
Dogtooth	33	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Hard to compact	1.00
		Sodium content	1.00			Slope	1.00
						Sodium content	1.00
Janesburg	22	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Hard to compact	1.00
		Sodium content	1.00			Slope	1.00
						Sodium content	1.00
Cabba	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
40B:							
Desart	24	Very limited		Very limited		Very limited	
		Sodium content	1.00	Seepage	1.00	Sodium content	1.00
		Seepage	1.00			Too sandy	0.50
		Too sandy	0.50			Seepage	0.14
Janesburg	16	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00
Ekalaka	22	Very limited		Very limited		Very limited	
		Sodium content	1.00	Seepage	1.00	Sodium content	1.00
		Seepage	1.00			Seepage	0.22
41:							
Williams	47	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Bowbells	37	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
41B:							
Williams	60	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Bowbells	27	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
42B:							
Williams	49	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Zahl	27	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
42C:							
Williams	58	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
43C:							
Williams	35	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Zahl	35	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
44D:							
Zahl	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Williams	21	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
44E:							
Zahl	46	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Williams	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
45F:							
Zahl	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Cabba	21	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Maschetah	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.04	Slope	0.04	Slope	0.04
46B:							
Dooley	41	Somewhat limited		Very limited		Somewhat limited	
		Too clayey	0.50	Seepage	1.00	Too clayey	0.50
Zahl	12	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
46C:							
Dooley	45	Somewhat limited		Very limited		Somewhat limited	
		Too clayey	0.50	Seepage	1.00	Too clayey	0.50
Zahl	22	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
46D:							
Dooley	31	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Seepage	1.00	Slope	0.63
		Too clayey	0.50	Slope	0.63	Too clayey	0.50
Zahl	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
48:							
Temvik	51	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
Wilton	38	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
49:							
Temvik	47	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
Williams	38	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
49B:							
Temvik	50	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
Williams	16	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
50B:							
Temvik	48	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
Zahl	26	Somewhat limited Too clayey	 0.50	Not limited		Somewhat limited Too clayey	 0.50
51B:							
Amor	67	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Shambo	15	Not limited		Not limited		Not limited	
51C:							
Amor	39	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Cabba	29	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
51D:							
Amor	42	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63
Cabba	29	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63
52B:							
Reeder	49	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Farnuf	16	Not limited		Not limited		Not limited	
52C:							
Reeder	34	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
52C:(cont.)							
Cabba	16	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
53B:							
Chama	43	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Sen	25	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Cabba	14	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
53C:							
Chama	40	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Cabba	28	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Sen	17	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
53D:							
Cabba	38	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63
Chama	26	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63
Sen	16	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63	Very limited Depth to bedrock Slope	 1.00 0.63
54F:							
Cabba	45	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Depth to bedrock Slope	 1.00 1.00
Sen	18	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Depth to bedrock Slope	 1.00 1.00
Chama	15	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Depth to bedrock Slope	 1.00 1.00
55B:							
Sen	25	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock	 1.00
Janesburg	34	Very limited Depth to bedrock Sodium content	 1.00 1.00	Very limited Depth to bedrock	 1.00	Very limited Depth to bedrock Hard to compact Sodium content	 1.00 1.00 1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
56B:							
Lefor	78	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
56C:							
Lefor	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
61D:							
Beisigl	42	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	1.00
		Too sandy	0.50	Slope	0.37	Too sandy	0.50
		Slope	0.37			Slope	0.37
Flasher	28	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.37	Slope	0.37
		Slope	0.37				
61F:							
Beisigl	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	1.00
		Too sandy	0.50			Too sandy	0.50
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00				
Tally	17	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.50
		Slope	0.04	Slope	0.04	Slope	0.04
62F:							
Flasher	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	1.00	Slope	1.00
		Slope	1.00				
Rock outcrop	22	Not rated		Not rated		Not rated	
Vebar	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.52
63B:							
Vebar	44	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.52
Flasher	12	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00				

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
63C:							
Vebar	54	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.52
Flasher	10	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00				
63D:							
Vebar	32	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Seepage	0.52
Flasher	16	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.63	Slope	0.63
		Slope	0.63				
Tally	15	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Seepage	0.50
66B:							
Manning	66	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.52
70B:							
Regent	71	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
Savage	15	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
70C:							
Regent	43	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
Cabba	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
71B:							
Regent	38	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Janesburg	28	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00
71C:							
Regent	32	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
71C:(cont.)							
Janesburg	31	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00
72B:							
Moreau	46	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
72C:							
Moreau	46	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Wayden	17	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
72D:							
Moreau	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
						Slope	0.63
Cabba	27	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
80:							
Badland, high precipitation	90	Not rated		Not rated		Not rated	
83F:							
Cabba	46	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Badland, outcrop	36	Not rated		Not rated		Not rated	
84F:							
Cabba	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Chama	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Havrelon	14	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Too clayey	0.50				

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
88D:							
Brandenburg	39	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Slope	0.37	Slope	0.37	Slope	0.37
		Content of large stones	0.09			Gravel content	0.11
						Content of large stones	0.09
Searing	21	Very limited		Very limited		Not limited	
		Seepage	1.00	Seepage	1.00		
Dogtooth	12	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00	Slope	0.37	Hard to compact	1.00
		Slope	0.37			Sodium content	1.00
						Slope	0.37
88F:							
Brandenburg	38	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Content of large stones	0.09			Gravel content	0.11
						Content of large stones	0.09
Cabba	17	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
Dogtooth	12	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00
89F:							
Brandenburg	28	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.09			Gravel content	0.11
						Content of large stones	0.09
Cabba	22	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Badland, outcrop	16	Not rated		Not rated		Not rated	
90E:							
Manning	24	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.52
		Slope	0.16	Slope	0.16	Slope	0.16
Schaller	22	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	0.50			Too sandy	0.50

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
90E:(cont.)							
Wabek	22	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00	Seepage	1.00
		Slope	1.00			Slope	1.00
91F:							
Wabek	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00	Seepage	1.00
		Slope	1.00			Gravel content	1.00
						Slope	1.00
Zahl	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
93B:							
Lehr	37	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.21
Stady	27	Very limited		Very limited		Not limited	
		Seepage	1.00	Seepage	1.00		
94B:							
Searing	60	Very limited		Very limited		Not limited	
		Seepage	1.00	Seepage	1.00		
Ringling	19	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Gravel content	0.56
						Seepage	0.52
95:							
Havrelon	96	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
96:							
Pits, gravel and sand	85	Not rated		Not rated		Not rated	
98F:							
Tinsley	53	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Seepage	0.52
						Gravel content	0.11
Chanta	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
99:							
Mckeen	73	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
		Seepage	1.00	Seepage	1.00	Seepage	0.14
		Too sandy	0.50				

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100F:							
Boxwell	34	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Cabbart	32	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Arikara	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
101F:							
Cabbart	41	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Badland, outcrop	27	Not rated		Not rated		Not rated	
102B:							
Kremlin	26	Not limited		Not limited		Not limited	
Ethridge	22	Not limited		Not limited		Not limited	
Gerda	19	Very limited		Not limited		Very limited	
		Sodium content	1.00			Sodium content	1.00
		Seepage	1.00			Too clayey	1.00
						Seepage	0.15
103B:							
Chinook	42	Not limited		Not limited		Very limited	
						Seepage	1.00
Rhame	28	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Seepage	0.52
103D:							
Rhame	42	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37			Seepage	0.52
						Slope	0.37
Chinook	32	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Seepage	1.00
						Slope	0.37
103F:							
Rhame	29	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
						Seepage	0.52
Fleak	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
		Too sandy	0.50			Seepage	1.00
						Too sandy	0.50

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
104E:							
Badland, outcrop----	54	Not rated		Not rated		Not rated	
Patent----------	25	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Slope	0.37
		Slope	0.37	Slope	0.37		
105:							
Havre----------	77	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
106:							
Glendive----------	70	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.52
		Too sandy	0.50			Too sandy	0.50
107:							
Kremlin----------	77	Not limited		Not limited		Not limited	
108B:							
Hanly----------	81	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
109:							
Havre, wooded-------	80	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
110B:							
Maltese----------	39	Very limited		Very limited		Very limited	
		Sodium content	1.00	Seepage	1.00	Sodium content	1.00
		Seepage	1.00			Too clayey	0.50
		Too clayey	0.50			Seepage	0.16
Gerda----------	30	Very limited		Not limited		Very limited	
		Sodium content	1.00			Sodium content	1.00
		Seepage	1.00			Too clayey	1.00
						Seepage	0.15
111D:							
Gerda----------	16	Very limited		Not limited		Very limited	
		Sodium content	1.00			Sodium content	1.00
		Seepage	1.00			Too clayey	1.00
						Seepage	0.15
Kirby----------	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Seepage	1.00
		Content of large stones	0.01			Gravel content	1.00
						Slope	0.37
						Content of large stones	0.01
111F:							
Kirby----------	49	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Seepage	1.00
		Content of large stones	0.01			Gravel content	1.00
						Slope	1.00
						Content of large stones	0.01

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
111F:(cont.)							
Scairt	16	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
112F:							
Kirby	39	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Seepage	1.00
		Content of large stones	0.01			Gravel content	1.00
						Slope	1.00
						Content of large stones	0.01
Badland, outcrop	23	Not rated		Not rated		Not rated	
Patent	13	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Slope	1.00
		Slope	1.00	Slope	1.00		
113F:							
Lonna	34	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
Cabbart	33	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
114:							
Channel	40	Not rated		Not rated		Not rated	
Glendive	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.50	Flooding	0.40	Seepage	0.52
		Flooding	0.40			Too sandy	0.50
Havre	18	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
115F:							
Badland, outcrop	30	Not rated		Not rated		Not rated	
Arikara	28	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabbart	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
116F:							
Kremlin	19	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
Cabbart	29	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
117:							
Wolf Point	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
118F:							
Lonna	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Kirby	34	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Seepage	1.00
		Content of large stones	0.01			Gravel content	1.00
						Slope	1.00
						Content of large stones	0.01
Cabbart	16	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
119F:							
Patent	33	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Slope	0.37
		Slope	0.37	Slope	0.37		
Badland, outcrop	21	Not rated		Not rated		Not rated	
Cabbart	21	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
121F:							
Maltese	25	Very limited		Very limited		Very limited	
		Sodium content	1.00	Seepage	1.00	Sodium content	1.00
		Seepage	1.00	Slope	0.04	Too clayey	0.50
		Too clayey	0.50			Seepage	0.16
		Slope	0.04			Slope	0.04
Lonna	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Arikara	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
127:							
Maschetah	82	Not limited		Not limited		Not limited	
127B:							
Maschetah	87	Not limited		Not limited		Not limited	
127C:							
Maschetah	70	Not limited		Not limited		Not limited	
131B:							
Lonna	87	Not limited		Not limited		Not limited	
131C:							
Lonna	64	Not limited		Not limited		Not limited	
132C:							
Patent	38	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
132C:(cont.)							
Gerda	27	Very limited		Not limited		Very limited	
		Sodium content	1.00			Sodium content	1.00
		Seepage	1.00			Too clayey	1.00
						Seepage	0.15
Slickspots	10	Not rated		Not rated		Not rated	
138E:							
Scairt	31	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37			Slope	0.37
Maltese	22	Very limited		Very limited		Very limited	
		Sodium content	1.00	Seepage	1.00	Sodium content	1.00
		Seepage	1.00	Slope	0.96	Slope	0.96
		Slope	0.96			Too clayey	0.50
		Too clayey	0.50			Seepage	0.16
Boxwell	10	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37			Slope	0.37
145F:							
Zahl	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Cabba	21	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Arikara	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
146B:							
Dooley	60	Somewhat limited		Very limited		Somewhat limited	
		Too clayey	0.50	Seepage	1.00	Too clayey	0.50
151B:							
Boxwell	46	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
Kremlin	43	Not limited		Not limited		Not limited	
151D:							
Boxwell	38	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37			Slope	0.37
Kremlin	28	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
154F:							
Arikara	33	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Shambo	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
154F:(cont.)							
Cabba	18	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
161F:							
Beisigl	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	1.00
		Too sandy	0.50			Too sandy	0.50
Flasher	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00				
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
164D:							
Vebar, extremely stony	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.52
		Slope	0.04	Slope	0.04	Slope	0.04
171:							
Lohler, moderately saline	86	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00				
180:							
Badland	88	Not rated		Not rated		Not rated	
183F:							
Badland, outcrop	51	Not rated		Not rated		Not rated	
Cabba	32	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
187F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabbart	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
193B:							
Chanta	81	Not limited		Not limited		Not limited	

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
194F:							
Kirby	42	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.01			Seepage	1.00
						Gravel content	1.00
						Content of large stones	0.01
Arikara	27	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Badland, outcrop	16	Not rated		Not rated		Not rated	
195:							
Havrelon	42	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
199:							
Mckeen	78	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Too sandy	0.50
		Seepage	1.00	Seepage	1.00	Seepage	0.14
		Too sandy	0.50				
201F:							
Badland, outcrop	63	Not rated		Not rated		Not rated	
Cabbart	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
202D:							
Boxwell	27	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37			Slope	0.37
Scairt	18	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37			Slope	0.37
Maltese	14	Very limited		Very limited		Very limited	
		Sodium content	1.00	Seepage	1.00	Sodium content	1.00
		Seepage	1.00	Slope	0.37	Too clayey	0.50
		Too clayey	0.50			Slope	0.37
		Slope	0.37			Seepage	0.16
203D:							
Rhame	23	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.04	Depth to bedrock	1.00
		Slope	0.04			Seepage	0.52
						Slope	0.04

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
203D:(cont.)							
Kremlin	16	Not limited		Not limited		Not limited	
Maltese	15	Very limited		Very limited		Very limited	
		Sodium content	1.00	Seepage	1.00	Sodium content	1.00
		Seepage	1.00			Too clayey	0.50
		Too clayey	0.50			Seepage	0.16
203F:							
Rhame	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
						Seepage	0.52
Scairt	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
Kremlin	13	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
205:							
Havre, rarely flooded	89	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
206:							
Glendive, rarely flooded	84	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.50	Flooding	0.40	Seepage	0.52
		Flooding	0.40			Too sandy	0.50
207:							
Harriet	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Sodium content	1.00				
211F:							
Cabba	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Badland, outcrop	34	Not rated		Not rated		Not rated	
Arikara	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
212:							
Trembles	70	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.21
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Seepage	1.00	Seepage	1.00		

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
213:							
Havrelon, slightly wet	92	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
214:							
Channel	40	Not rated		Not rated		Not rated	
Korchea, wooded	52	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
217:							
Wolf Point, wooded	78	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00				
218F:							
Cherry	23	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Cabba	22	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Brandenburg	16	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.09			Gravel content	0.11
						Content of large stones	0.09
227:							
Haydraw	84	Not limited		Not limited		Not limited	
227B:							
Haydraw	72	Not limited		Not limited		Not limited	
231C:							
Patent	32	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
Gullied land	19	Not rated		Not rated		Not rated	
Glendive	13	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.52
		Too sandy	0.50			Too sandy	0.50
232C:							
Lambert	41	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
Slickspots	21	Not rated		Not rated		Not rated	

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
232C:(cont.)							
Rhoades	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Sodium content	1.00
		Sodium content	1.00				
238B:							
Janesburg	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00
Dogtooth	29	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00			Hard to compact	1.00
						Sodium content	1.00
239D:							
Vebar	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.52
		Slope	0.04	Slope	0.04	Slope	0.04
Janesburg	19	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Sodium content	1.00	Slope	0.04	Hard to compact	1.00
		Slope	0.04			Sodium content	1.00
						Slope	0.04
242F:							
Zahl	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Williams	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Arikara	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
287F:							
Arikara	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Cabba	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
299:							
Minnewaukan	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Too sandy	0.50
		Too sandy	0.50				

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
299:(cont.)							
Banks	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Too sandy	0.50
		Too sandy	0.50				
Riverwash	30	Not rated		Not rated		Not rated	
317:							
Lallie	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00	Ponding	1.00	Hard to compact	1.00
		Ponding	1.00			Ponding	1.00
331B:							
Cherry	33	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Gullied land	21	Not rated		Not rated		Not rated	
Havrelon	16	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Too clayey	0.50				
340B:							
Niobell	42	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Williams	27	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
341B:							
Noonan	39	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Niobell	31	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Williams	23	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
341C:							
Noonan	23	Not limited		Not limited		Not limited	
Williams	22	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
403F:							
Rhame	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
						Seepage	0.52
Arikara	23	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
403F:(cont.)							
Fleak	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
		Too sandy	0.50			Seepage	1.00
						Too sandy	0.50
404F:							
Badland, outcrop	42	Not rated		Not rated		Not rated	
Lambert	34	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Slope	0.37
		Slope	0.37	Slope	0.37		
Cabba	12	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
406:							
Glendive, wooded	74	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.52
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
		Too sandy	0.50				
408B:							
Hanly, wooded	61	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
410:							
Riverwash	85	Not rated		Not rated		Not rated	
411B:							
Lambert	81	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
412E:							
Lambert	37	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
Brandenburg	26	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.09			Gravel content	0.11
						Content of large stones	0.09
442F:							
Zahl	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Williams	24	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50

Sanitary Facilities - Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
460C:							
Zahl	28	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Williams	20	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Cabba	19	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
460D:							
Zahl	32	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Cabba	24	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
Williams	13	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
470C:							
Zahl	31	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Tally	18	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.50
Williams	16	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
470D:							
Zahl	31	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Beisigl	27	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too sandy	0.50			Too sandy	0.50
Tally	15	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Seepage	0.50
490:							
Riverwash	85	Not rated		Not rated		Not rated	
496:							
Pits, gravel and sand, low precipitation	90	Not rated		Not rated		Not rated	
M-W:							
Miscellaneous water-	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2:								
Heil	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to saturated zone	0.00	Low strength	0.00
	Thickest layer not a source	0.00			Sodium content	0.00	Shrink-swell	0.12
					Salinity	0.00		
3:								
Dimmick	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to saturated zone	0.00	Shrink-swell	0.12
	Thickest layer not a source	0.00						
5:								
Tonka	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Too clayey	0.14	Shrink-swell	0.81
	Thickest layer not a source	0.00						
Hamerly	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Carbonate content	0.68	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to saturated zone	0.88	Shrink-swell	0.87
	Thickest layer not a source	0.00					Depth to saturated zone	0.88
7:								
Harriet	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00	Low strength	0.00
	Thickest layer not a source	0.00			Salinity	0.00	Shrink-swell	0.89
					Too clayey	0.17		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9:								
Grano	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to saturated zone	0.00	Shrink-swell	0.12
10:								
Banks	Improbable Gravel Source		Fair		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01	Too sandy	0.06		
	Thickest layer not a source	0.00	Bottom layer	0.33				
10D:								
Seroco	Improbable Gravel Source		Fair		Poor		Good	
	Bottom layer not a source	0.00	Thickest layer	0.02	Too sandy	0.00		
	Thickest layer not a source	0.00	Bottom layer	0.32	Slope	0.96		
Lohler	Improbable Gravel Source		Poor		Poor		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12
	Thickest layer not a source	0.00	Thickest layer	0.00				
11B:								
Patent	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.98	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.99	Shrink-swell	0.87
12:								
Trembles	Improbable Gravel Source		Fair		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01	Carbonate content	0.99		
	Thickest layer not a source	0.00	Bottom layer	0.12				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
13:								
Havrelon	Improbable Gravel Source		Poor Bottom layer	0.00	Good		Poor Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
14:								
Channel	Not rated		Not rated		Not rated		Not rated	
Korchea	Improbable Gravel Source		Poor Bottom layer	0.00	Good		Fair Shrink-swell	0.87
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
15:								
Korchea	Improbable Gravel Source		Poor Bottom layer	0.00	Good		Fair Shrink-swell	0.87
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
16:								
Ridgelawn	Improbable Gravel Source		Fair Thickest layer	0.00	Good		Fair Shrink-swell	0.90
	Bottom layer not a source	0.00	Bottom layer	0.09				
	Thickest layer not a source	0.00						
17:								
Lohler	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Too clayey	0.00	Fair Shrink-swell	0.12
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
19:								
Hoffmanville	Improbable Gravel Source		Poor		Poor		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.42
	Thickest layer not a source	0.00	Thickest layer	0.00				
20:								
Scorio	Improbable Gravel Source		Poor		Poor		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12
	Thickest layer not a source	0.00	Thickest layer	0.00				
21B:								
Tally	Improbable Gravel Source		Fair		Good		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00	Bottom layer	0.02				
Parshall	Improbable Gravel Source		Fair		Good		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00	Bottom layer	0.05				
21C:								
Tally	Improbable Gravel Source		Fair		Good		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00	Bottom layer	0.02				
Parshall	Improbable Gravel Source		Fair		Good		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00	Bottom layer	0.05				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
22:								
Velva	Improbable		Fair		Good		Good	
	Source		Bottom layer	0.00				
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00						
23B:								
Lihen	Improbable		Fair		Fair		Good	
	Source		Thickest layer	0.07	Too sandy	0.38		
	Bottom layer not a source	0.00	Bottom layer	0.64				
	Thickest layer not a source	0.00						
Parshall	Improbable		Fair		Good		Good	
	Source		Thickest layer	0.01				
	Bottom layer not a source	0.00	Bottom layer	0.05				
	Thickest layer not a source	0.00						
23D:								
Beisigl	Improbable		Fair		Fair		Poor	
	Source		Bottom layer	0.02	Too sandy	0.36	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.02	Depth to bedrock	0.54		
	Thickest layer not a source	0.00			Slope	0.63		
Telfer	Improbable		Fair		Poor		Good	
	Source		Thickest layer	0.02	Too sandy	0.00		
	Bottom layer not a source	0.00	Bottom layer	0.25	Slope	0.63		
	Thickest layer not a source	0.00						
24:								
Arnegard	Improbable		Poor		Good		Good	
	Source		Bottom layer	0.00				
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
25:								
Farnuf	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87
25B:								
Farnuf	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87
25C:								
Farnuf	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87
26:								
Tansem	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Carbonate content	 0.80	Good	
Roseglen	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Fair Shrink-swell	 0.87
26B:								
Tansem	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Carbonate content	 0.80	Good	

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
26B:(cont.)								
Roseglen	Improbable Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Fair Shrink-swell	 0.87
27:								
Golva	Improbable Source Bottom layer not a source Thickest layer not a source	Gravel 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87
27B:								
Golva	Improbable Source Bottom layer not a source Thickest layer not a source	Gravel 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87
27C:								
Golva	Improbable Source Bottom layer not a source Thickest layer not a source	Gravel 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87
29:								
Savage	Improbable Source Bottom layer not a source Thickest layer not a source	Gravel 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Too clayey	 0.00	Poor Low strength Shrink-swell	 0.00 0.12

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
29B:								
Savage	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.12
29C:								
Savage	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.12
30:								
Lawther	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.12
31B:								
Cherry	Improbable Gravel Source		Poor		Good		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00	Thickest layer	0.00				
31C:								
Cherry	Improbable Gravel Source		Poor		Good		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00	Thickest layer	0.00				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
32F:								
Cherry	Improbable		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Slope	0.00	Slope	0.50
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
Cabba	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Thickest layer not a source	0.00					Low strength	0.22
33:								
Belfield	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Sodium content	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00	Shrink-swell	0.15
	Thickest layer not a source	0.00			Too clayey	0.19		
Grail	Improbable		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Too clayey	0.25	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.21
	Thickest layer not a source	0.00						
33B:								
Belfield	Improbable		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Too clayey	0.19	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.22	Shrink-swell	0.15
	Thickest layer not a source	0.00						
Savage	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Too clayey	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.12
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
34B:								
Daglum	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00	Shrink-swell	0.12
					Salinity	0.00		
Belfield	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.19	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Sodium content	0.22	Shrink-swell	0.15
36B:								
Rhoades	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00	Shrink-swell	0.12
					Too clayey	0.00		
Daglum	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00	Shrink-swell	0.28
					Salinity	0.00		
38B:								
Dogtooth	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
					Too clayey	0.00		
					Depth to bedrock	0.54		
Janesburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
					Depth to bedrock	0.54		
					Sodium content	0.78		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
38F:								
Dogtooth	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00	Slope	0.98
					Slope	0.00		
					Too clayey	0.00		
					Depth to bedrock	0.54		
Janesburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.98
					Too clayey	0.00		
					Depth to bedrock	0.54		
					Sodium content	0.78		
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Low strength	0.22
							Slope	0.50
40B:								
Desart	Improbable Gravel Source		Fair		Good		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00	Botton layer	0.05				
Janesburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
					Depth to bedrock	0.54		
					Sodium content	0.78		
Ekalaka	Improbable Gravel Source		Fair		Poor		Good	
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00		
	Thickest layer not a source	0.00	Bottom layer	0.08	Salinity	0.50		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
41:								
Williams	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
Bowbells	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
41B:								
Williams	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
Bowbells	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
42B:								
Williams	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
Zahl	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
42C:								
Williams	Improbable		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
43C:								
Williams	Improbable		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
Zahl	Improbable		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
44D:								
Zahl	Improbable		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Slope	0.37	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
Williams	Improbable		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Slope	0.37	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
44E:								
Zahl	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Slope	0.50
	Thickest layer not a source	0.00					Shrink-swell	0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
44E:(cont.)								
Williams	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Slope	 0.00	Poor Low strength Slope Shrink-swell	 0.00 0.50 0.87
45F:								
Zahl	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Slope	 0.00	Poor Slope Low strength Shrink-swell	 0.00 0.00 0.87
Cabba	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Depth to bedrock Slope	 0.00 0.00	Poor Depth to bedrock Slope Low strength	 0.00 0.00 0.22
Maschetah	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Carbonate content Slope	 0.32 0.96	Fair Shrink-swell	 0.87
46B:								
Dooley	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Fair Bottom layer Thickest layer	 0.00 0.02	Fair Too clayey	 0.29	Fair Shrink-swell	 0.95
Zahl	Improbable Gravel Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
46C:								
Dooley	Improbable Gravel		Fair		Fair		Fair	
	Source		Bottom layer	0.00	Too clayey	0.29	Shrink-swell	0.95
	Bottom layer not a source	0.00	Thickest layer	0.02				
	Thickest layer not a source	0.00						
Zahl	Improbable Gravel		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
46D:								
Dooley	Improbable Gravel		Fair		Fair		Fair	
	Source		Bottom layer	0.00	Too clayey	0.29	Shrink-swell	0.95
	Bottom layer not a source	0.00	Thickest layer	0.02	Slope	0.37		
	Thickest layer not a source	0.00						
Zahl	Improbable Gravel		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Slope	0.37	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
48:								
Temvik	Improbable Gravel		Poor		Good		Fair	
	Source		Bottom layer	0.00			Shrink-swell	0.98
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
Wilton	Improbable Gravel		Poor		Good		Fair	
	Source		Bottom layer	0.00			Shrink-swell	0.99
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
49:								
Temvik	Improbable Gravel Source		Poor		Good		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00			Shrink-swell	0.98
	Thickest layer not a source	0.00	Thickest layer	0.00				
Williams	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
49B:								
Temvik	Improbable Gravel Source		Poor		Good		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00			Shrink-swell	0.98
	Thickest layer not a source	0.00	Thickest layer	0.00				
Williams	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
50B:								
Temvik	Improbable Gravel Source		Poor		Good		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00			Shrink-swell	0.98
	Thickest layer not a source	0.00	Thickest layer	0.00				
Zahl	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
51B:								
Amor	Improbable Gravel		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.78
	Thickest layer not a source	0.00						
Shambo	Improbable Gravel		Poor		Good		Good	
	Source		Bottom layer	0.00				
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
51C:								
Amor	Improbable Gravel		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.78
	Thickest layer not a source	0.00						
Cabba	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00						
51D:								
Amor	Improbable Gravel		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Slope	0.37	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.78
	Thickest layer not a source	0.00						
Cabba	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.37	Low strength	0.22
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
52B:								
Reeder	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
							Shrink-swell	0.87
Farnuf	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
52C:								
Reeder	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
							Shrink-swell	0.87
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
53B:								
Chama	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.92	Low strength	0.00
Sen	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.92	Low strength	0.00

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
53B:(cont.)								
Cabba	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00						
53C:								
Chama	Improbable Gravel		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.92	Low strength	0.00
	Thickest layer not a source	0.00						
Cabba	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00						
Sen	Improbable Gravel		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.92	Low strength	0.00
	Thickest layer not a source	0.00						
53D:								
Cabba	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.37	Low strength	0.22
	Thickest layer not a source	0.00						
Chama	Improbable Gravel		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Slope	0.37	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
	Thickest layer not a source	0.00			Carbonate content	0.92		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
53D:(cont.)								
Sen	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.37	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
					Carbonate content	0.92		
54F:								
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
							Low strength	0.22
Sen	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
					Carbonate content	0.92	Slope	0.50
Chama	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Slope	0.00
					Carbonate content	0.92	Low strength	0.00
55B:								
Sen	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.92	Low strength	0.00
Janesburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
					Depth to bedrock	0.54		
					Sodium content	0.78		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
56B:								
Lefor	Improbable Gravel Source		Poor Bottom layer	0.00	Fair Depth to bedrock	0.54	Poor Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
56C:								
Lefor	Improbable Gravel Source		Poor Bottom layer	0.00	Fair Depth to bedrock	0.54	Poor Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
61D:								
Beisigl	Improbable Gravel Source		Fair Bottom layer	0.02	Fair Too sandy	0.36	Poor Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.02	Depth to bedrock	0.54		
	Thickest layer not a source	0.00			Slope	0.63		
Flasher	Improbable Gravel Source		Fair Thickest layer	0.00	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
	Bottom layer not a source	0.00	Bottom layer	0.02	Too sandy	0.02		
	Thickest layer not a source	0.00			Slope	0.63		
61F:								
Beisigl	Improbable Gravel Source		Fair Bottom layer	0.02	Poor Slope	0.00	Poor Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.02	Too sandy	0.36	Slope	0.00
	Thickest layer not a source	0.00			Depth to bedrock	0.54		
Flasher	Improbable Gravel Source		Fair Thickest layer	0.00	Poor Slope	0.00	Poor Depth to bedrock	0.00
	Bottom layer not a source	0.00	Bottom layer	0.02	Depth to bedrock	0.00	Slope	0.00
	Thickest layer not a source	0.00			Too sandy	0.02		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
61F:(cont.)								
Tally	Improbable Gravel Source		Poor		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.96		
	Thickest layer not a source	0.00	Bottom layer	0.00				
62F:								
Flasher	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Bottom layer	0.02	Slope	0.00	Slope	0.00
					Too sandy	0.02		
Rock outcrop	Not rated		Not rated		Not rated		Not rated	
Vebar	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.01	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.01	Depth to bedrock	0.71	Slope	0.00
63B:								
Vebar	Improbable Gravel Source		Fair		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.01	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.01				
Flasher	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Bottom layer	0.02	Too sandy	0.02		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
63C:								
Vebar	Improbable Gravel		Fair		Fair		Poor	
	Source		Bottom layer	0.01	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00						
Flasher	Improbable Gravel		Fair		Poor		Poor	
	Source		Thickest layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Bottom layer	0.02	Too sandy	0.02		
	Thickest layer not a source	0.00						
63D:								
Vebar	Improbable Gravel		Fair		Fair		Poor	
	Source		Bottom layer	0.01	Slope	0.37	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.01	Depth to bedrock	0.54		
	Thickest layer not a source	0.00						
Flasher	Improbable Gravel		Fair		Poor		Poor	
	Source		Thickest layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Bottom layer	0.02	Too sandy	0.02		
	Thickest layer not a source	0.00			Slope	0.37		
Tally	Improbable Gravel		Fair		Fair		Good	
	Source		Thickest layer	0.01	Slope	0.37		
	Bottom layer not a source	0.00	Bottom layer	0.02				
	Thickest layer not a source	0.00						
66B:								
Manning	Possible Gravel		Fair		Good		Good	
	Source		Bottom layer	0.00				
	Thickest layer not a source	0.00	Thickest layer	0.01				
	Bottom layer	0.38						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70B:								
Regent	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
							Shrink-swell	0.12
Savage	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.12
70C:								
Regent	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
							Shrink-swell	0.12
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
71B:								
Regent	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
							Shrink-swell	0.12
								0.00
Janesburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
					Depth to bedrock	0.54		
					Sodium content	0.78		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
71C:								
Regent	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
							Shrink-swell	0.12
Janesburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
					Depth to bedrock	0.54		
					Sodium content	0.78		
72B:								
Moreau	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00	Low strength	0.00
					Depth to bedrock	0.54	Shrink-swell	0.12
72C:								
Moreau	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00	Low strength	0.00
					Depth to bedrock	0.54	Shrink-swell	0.12
Wayden	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00	Low strength	0.00
					Salinity	0.00	Shrink-swell	0.12
72D:								
Moreau	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00	Low strength	0.00
					Slope	0.37	Shrink-swell	0.12
					Depth to bedrock	0.54		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
72D:(cont.)								
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.37	Low strength	0.22
80:								
Badland, high precipitation	Not rated		Not rated		Not rated		Not rated	
83F:								
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
					Salinity	0.88	Low strength	0.22
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
84F:								
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
							Low strength	0.22
Chama	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Low strength	0.00
					Carbonate content	0.92	Slope	0.32
Havrelon	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
88D:								
Brandenburg	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.63		
	Thickest layer not a source	0.00						
Searing	Possible		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00				
	Bottom layer	0.14						
Dogtooth	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Sodium content	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
	Thickest layer not a source	0.00			Too clayey	0.00		
					Depth to bedrock	0.54		
					Slope	0.63		
88F:								
Brandenburg	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Rock fragments	0.00	Slope	0.00
	Thickest layer not a source	0.00						
Cabba	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Low strength	0.00
	Thickest layer not a source	0.00					Slope	0.00
							Shrink-swell	0.87
Dogtooth	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00	Slope	0.50
	Thickest layer not a source	0.00			Salinity	0.00		
					Too clayey	0.00		
					Depth to bedrock	0.54		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
89F:								
Brandenburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
							Low strength	0.22
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
90E:								
Manning	Possible Gravel Source		Fair		Fair		Good	
	Thickest layer not a source	0.00	Bottom layer	0.00	Slope	0.84		
	Bottom layer	0.38	Thickest layer	0.01				
Schaller	Possible Gravel Source		Fair		Poor		Fair	
	Thickest layer not a source	0.00	Thickest layer	0.03	Slope	0.00	Slope	0.98
	Bottom layer	0.04	Bottom layer	0.14	Rock fragments	0.00		
					Too sandy	0.01		
					Hard to reclaim, rock fragments	0.92		
Wabek	Possible Gravel Source		Fair		Poor		Fair	
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.92
	Bottom layer	0.27	Bottom layer	0.61				
91F:								
Wabek	Possible Gravel Source		Fair		Poor		Fair	
	Thickest layer not a source	0.00	Thickest layer	0.00	Too sandy	0.00	Slope	0.18
	Bottom layer	0.27	Bottom layer	0.61	Rock fragments	0.00		
					Hard to reclaim	0.00		
					Slope	0.00		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
91F:(cont.)								
Zahl	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Slope	0.18
	Thickest layer not a source	0.00					Shrink-swell	0.87
93B:								
Lehr	Possible		Fair		Good		Fair	
	Source		Thickest layer	0.00			Shrink-swell	0.98
	Thickest layer not a source	0.00	Bottom layer	0.61				
	Bottom layer	0.23						
Stady	Possible		Fair		Good		Good	
	Source		Thickest layer	0.00				
	Thickest layer not a source	0.00	Bottom layer	0.61				
	Bottom layer	0.23						
94B:								
Searing	Possible		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00				
	Bottom layer	0.14						
Ringling	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
95:								
Havrelon	Improbable		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.84
	Thickest layer not a source	0.00						
96:								
Pits, gravel and sand	Not rated		Not rated		Not rated		Not rated	

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
98F:								
Tinsley	Possible Gravel		Fair		Poor		Fair	
	Source		Thickest layer	0.00	Rock fragments	0.00	Slope	0.32
	Thickest layer not a source	0.00	Bottom layer	0.07	Slope	0.00	Cobble content	0.79
	Bottom layer	0.34						
Chanta	Possible Gravel		Fair		Fair		Poor	
	Source		Thickest layer	0.00	Slope	0.63	Low strength	0.00
	Thickest layer not a source	0.00	Bottom layer	0.63	Rock fragments	0.97	Shrink-swell	1.00
	Bottom layer	0.08						
99:								
Mckeen	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	0.89
100F:								
Boxwell	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.54	Slope	0.00
	Thickest layer not a source	0.00			Carbonate content	0.80		
Cabbart	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00			Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87
Arikara	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Slope	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	1.00

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
101F:								
Cabbart	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
					Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
102B:								
Kremlin	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Carbonate content	0.97	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.89
Ethridge	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.36	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.43
Gerda	Improbable Gravel Source		Poor		Poor		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Shrink-swell	0.60
	Thickest layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00		
					Too clayey	0.00		
103B:								
Chinook	Improbable Gravel Source		Fair		Good		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00	Bottom layer	0.02				
Rhame	Improbable Gravel Source		Fair		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.01	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.01				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
103D:								
Rhame	Improbable Gravel Source		Fair		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.01	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.01	Slope	0.63		
Chinook	Improbable Gravel Source		Fair		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01	Slope	0.63		
	Thickest layer not a source	0.00	Bottom layer	0.02				
103F:								
Rhame	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.01	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.01	Depth to bedrock	0.54	Slope	0.00
Fleak	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Bottom layer	0.06	Depth to bedrock	0.00	Slope	0.00
					Too sandy	0.36		
104E:								
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
Patent	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.63	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00	Sodium content	0.98	Shrink-swell	0.87
					Carbonate content	0.99		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
105:								
Havre	Improbable		Poor		Good		Good	
	Source		Bottom layer	0.00				
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
106:								
Glendive	Improbable		Fair		Fair		Good	
	Source		Thickest layer	0.00	Carbonate content	0.99		
	Bottom layer not a source	0.00	Bottom layer	0.06				
	Thickest layer not a source	0.00						
107:								
Kremlin	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Carbonate content	0.97	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.89
	Thickest layer not a source	0.00						
108B:								
Hanly	Improbable		Fair		Fair		Good	
	Source		Thickest layer	0.01	Too sandy	0.50		
	Bottom layer not a source	0.00	Bottom layer	0.16				
	Thickest layer not a source	0.00						
109:								
Havre, wooded	Improbable		Poor		Good		Good	
	Source		Bottom layer	0.00				
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
110B:								
Maltese	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Sodium content	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00	Shrink-swell	0.53
	Thickest layer not a source	0.00			Too clayey	0.07		
Gerda	Improbable		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Salinity	0.00	Shrink-swell	0.60
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00		
	Thickest layer not a source	0.00			Too clayey	0.00		
111D:								
Gerda	Improbable		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Salinity	0.00	Shrink-swell	0.60
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00		
	Thickest layer not a source	0.00			Too clayey	0.00		
Kirby	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.63		
	Thickest layer not a source	0.00						
111F:								
Kirby	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00						
Scairt	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Sodium content	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00	Slope	0.92
	Thickest layer not a source	0.00			Slope	0.00		
					Too clayey	0.00		
					Depth to bedrock	0.54		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
112F:								
Kirby	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
Patent	Improbable Gravel Source		Poor		Poor		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00	Sodium content	0.98	Slope	0.50
					Carbonate content	0.99	Shrink-swell	0.87
113F:								
Lonna	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.63	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.88	Shrink-swell	0.87
Cabbart	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Low strength	0.00
					Carbonate content	0.99	Slope	0.32
							Shrink-swell	0.87
114:								
Channel	Not rated		Not rated		Not rated		Not rated	
Glendive	Improbable Gravel Source		Fair		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.99		
	Thickest layer not a source	0.00	Bottom layer	0.06				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
114:(cont.)								
Havre	Improbable Gravel Source		Poor		Good		Good	
	Bottom layer not a source	0.00	Bottom layer	0.00				
	Thickest layer not a source	0.00	Thickest layer	0.00				
115F:								
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
Arikara	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
							Shrink-swell	1.00
Cabbart	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
					Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87
116F:								
Kremlin	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.37	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.97	Shrink-swell	0.89
Cabbart	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
					Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
117:								
Wolf Point	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Too clayey	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.88	Shrink-swell	0.12
	Thickest layer not a source	0.00						
118F:								
Lonna	Improbable		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Slope	0.00	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.88	Shrink-swell	0.87
	Thickest layer not a source	0.00						
Kirby	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00						
Cabbart	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00			Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87
119F:								
Patent	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Slope	0.63	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.98	Shrink-swell	0.87
	Thickest layer not a source	0.00			Carbonate content	0.99		
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
Cabbart	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00			Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
121F:								
Maltese	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Sodium content	0.00	Fair Shrink-swell	0.53
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
	Thickest layer not a source	0.00			Too clayey	0.07		
					Slope	0.96		
Lonna	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Slope	0.00	Fair Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.88	Shrink-swell	0.87
	Thickest layer not a source	0.00						
Arikara	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Slope	0.00	Poor Slope	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	1.00
127:								
Maschetah	Improbable Gravel Source		Poor Bottom layer	0.00	Fair Carbonate content	0.32	Fair Shrink-swell	0.87
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
127B:								
Maschetah	Improbable Gravel Source		Poor Bottom layer	0.00	Fair Carbonate content	0.32	Fair Shrink-swell	0.87
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
127C:								
Maschetah	Improbable Gravel Source		Poor Bottom layer	0.00	Fair Carbonate content	0.32	Fair Shrink-swell	0.87
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
131B:								
Lonna	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.88	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
131C:								
Lonna	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.88	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
132C:								
Patent	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.98	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.99	Shrink-swell	0.87
Gerda	Improbable Gravel Source		Poor		Poor		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Shrink-swell	0.60
	Thickest layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00		
					Too clayey	0.00		
Slickspots	Not rated		Not rated		Not rated		Not rated	
138E:								
Scairt	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
					Too clayey	0.00		
					Depth to bedrock	0.54		
					Slope	0.63		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
138E:(cont.)								
Maltese	Improbable Gravel Source		Poor		Poor		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.00	Shrink-swell	0.53
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
					Slope	0.04		
					Too clayey	0.07		
Boxwell	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.63		
					Carbonate content	0.80		
145F:								
Zahl	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.00
							Shrink-swell	0.87
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
							Low strength	0.22
Arikara	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
							Shrink-swell	1.00
							Low strength	0.22
146B:								
Dooley	Improbable Gravel Source		Fair		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.29	Shrink-swell	0.95
	Thickest layer not a source	0.00	Thickest layer	0.02				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
151B:								
Boxwell	Improbable		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.80		
	Thickest layer not a source	0.00						
Kremlin	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Carbonate content	0.97	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.89
	Thickest layer not a source	0.00						
151D:								
Boxwell	Improbable		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.63		
	Thickest layer not a source	0.00			Carbonate content	0.80		
Kremlin	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Slope	0.63	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.97	Shrink-swell	0.89
	Thickest layer not a source	0.00						
154F:								
Arikara	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Slope	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	1.00
Shambo	Improbable		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Slope	0.00	Slope	0.18
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
154F:(cont.)								
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Low strength	0.00
							Slope	0.00
							Shrink-swell	0.87
161F:								
Beisigl	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.02	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.02	Too sandy	0.32	Slope	0.00
					Depth to bedrock	0.54		
Flasher	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Bottom layer	0.02	Depth to bedrock	0.00	Slope	0.00
					Too sandy	0.36		
Arikara	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Content of organic matter	0.00	Content of organic matter	0.00			Shrink-swell	1.00
164D:								
Vebar, extremely stony	Improbable Gravel Source		Fair		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.01	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.01	Slope	0.96		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
171:								
Lohler, moderately saline	Improbable Gravel		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Salinity	0.00	Shrink-swell	0.12
	Bottom layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
	Thickest layer not a source	0.00						
180:								
Badland	Not rated		Not rated		Not rated		Not rated	
183F:								
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
Cabba	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00					Low strength	0.22
187F:								
Arikara	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Slope	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	1.00
Cabbart	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Thickest layer not a source	0.00			Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87
193B:								
Chanta	Possible Gravel		Fair		Fair		Poor	
	Source		Thickest layer	0.00	Rock fragments	0.97	Low strength	0.00
	Thickest layer not a source	0.00	Bottom layer	0.63			Shrink-swell	1.00
	Bottom layer	0.08						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
194F:								
Kirby	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Slope	0.00	Poor Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Rock fragments	0.00	Slope	0.00
	Thickest layer not a source	0.00						
Arikara	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Slope	0.00	Poor Slope	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	1.00
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
195:								
Havrelon	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Salinity	0.00	Fair Shrink-swell	0.87
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
199:								
Mckeen	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Depth to saturated zone	0.00	Poor Depth to saturated zone	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	0.89
201F:								
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
Cabbart	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00			Carbonate content	0.99	Low strength	0.00
							Shrink-swell	0.87

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
202D:								
Boxwell	Improbable		Poor		Fair		Poor	
	Source		Bottom layer	0.00	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.63		
	Thickest layer not a source	0.00			Carbonate content	0.80		
Scairt	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Sodium content	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
	Thickest layer not a source	0.00			Too clayey	0.00		
					Depth to bedrock	0.54		
					Slope	0.63		
Maltese	Improbable		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Sodium content	0.00	Shrink-swell	0.53
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
	Thickest layer not a source	0.00			Too clayey	0.07		
					Slope	0.63		
203D:								
Rhame	Improbable		Fair		Fair		Poor	
	Source		Bottom layer	0.01	Depth to bedrock	0.54	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.01	Slope	0.96		
	Thickest layer not a source	0.00						
Kremlin	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Carbonate content	0.97	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.89
	Thickest layer not a source	0.00						
Maltese	Improbable		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Sodium content	0.00	Shrink-swell	0.53
	Bottom layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
	Thickest layer not a source	0.00			Too clayey	0.07		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
203F:								
Rhame	Improbable Gravel		Fair		Poor		Poor	
	Source		Bottom layer	0.02	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.02	Depth to bedrock	0.54	Slope	0.00
	Thickest layer not a source	0.00			Too sandy	1.00		
Scairt	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00	Slope	0.50
	Thickest layer not a source	0.00			Salinity	0.00		
					Too clayey	0.00		
					Depth to bedrock	0.54		
Kremlin	Improbable Gravel		Poor		Poor		Fair	
	Source		Bottom layer	0.00	Slope	0.00	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.97	Slope	0.50
	Thickest layer not a source	0.00					Shrink-swell	0.89
205:								
Havre, rarely flooded	Improbable Gravel		Poor		Good		Good	
	Source		Bottom layer	0.00				
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
206:								
Glendive, rarely flooded	Improbable Gravel		Fair		Fair		Good	
	Source		Thickest layer	0.00	Carbonate content	0.99		
	Bottom layer not a source	0.00	Bottom layer	0.06				
	Thickest layer not a source	0.00						
207:								
Harriet	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00	Low strength	0.00
	Thickest layer not a source	0.00			Salinity	0.00	Shrink-swell	0.89
					Too clayey	0.17		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
211F:								
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
							Low strength	0.22
Badland, outcrop	Not rated		Not rated		Not rated		Not rated	
Arikara	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
							Shrink-swell	1.00
212:								
Trembles	Improbable Gravel Source		Fair		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01	Carbonate content	0.99		
	Thickest layer not a source	0.00	Bottom layer	0.12				
213:								
Havrelon, slightly wet	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
214:								
Channel	Not rated		Not rated		Not rated		Not rated	
Korchea, wooded	Improbable Gravel Source		Poor		Good		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00	Thickest layer	0.00				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
217:								
Wolf Point, wooded--	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Too clayey	0.00	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.88	Shrink-swell	0.12
218F:								
Cherry----------	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.37	Shrink-swell	0.87
	Thickest layer not a source	0.00	Thickest layer	0.00				
Cabba----------	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Low strength	0.22
							Slope	0.18
Brandenburg---------	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.18
227:								
Haydraw----------	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Carbonate content	0.54	Shrink-swell	0.87
	Thickest layer not a source	0.00	Thickest layer	0.00				
227B:								
Haydraw----------	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Carbonate content	0.54	Shrink-swell	0.87
	Thickest layer not a source	0.00	Thickest layer	0.00				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
231C:								
Patent	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Sodium content	0.98	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.99	Shrink-swell	0.87
	Thickest layer not a source	0.00						
Gullied land	Not rated		Not rated		Not rated		Not rated	
Glendive	Improbable		Fair		Fair		Good	
	Source		Thickest layer	0.00	Carbonate content	0.99		
	Bottom layer not a source	0.00	Bottom layer	0.06				
	Thickest layer not a source	0.00						
232C:								
Lambert	Improbable		Poor		Fair		Fair	
	Source		Bottom layer	0.00	Carbonate content	0.99	Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
Slickspots	Not rated		Not rated		Not rated		Not rated	
Rhoades	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Salinity	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.00	Shrink-swell	0.12
	Thickest layer not a source	0.00			Too clayey	0.00		
238B:								
Janesburg	Improbable		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
	Thickest layer not a source	0.00			Depth to bedrock	0.54		
					Sodium content	0.78		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
238B:(cont.)								
Dogtooth	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Sodium content	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Salinity	0.00		
					Too clayey	0.00		
					Depth to bedrock	0.54		
239D:								
Vebar	Improbable Gravel Source		Fair		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.01	Depth to bedrock	0.54	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.01	Slope	0.96		
Janesburg	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Salinity	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.00		
					Depth to bedrock	0.54		
					Sodium content	0.78		
					Slope	0.96		
242F:								
Zahl	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.00
							Shrink-swell	0.87
Williams	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.00
							Shrink-swell	0.87
Arikara	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
							Shrink-swell	1.00

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
287F:								
Arikara	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Slope	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
							Shrink-swell	1.00
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
							Low strength	0.22
299:								
Minnewaukan	Improbable Gravel Source		Fair		Poor		Poor	
	Bottom layer not a source	0.00	Thickest layer	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Thickest layer not a source	0.00	Bottom layer	0.12	Too sandy	0.78		
Banks	Improbable Gravel Source		Fair		Poor		Good	
	Bottom layer not a source	0.00	Bottom layer	0.02	Too sandy	0.00		
	Thickest layer not a source	0.00	Thickest layer	0.35				
Riverwash	Not rated		Not rated		Not rated		Not rated	
317:								
Lallie	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Too clayey	0.30	Low strength	0.00
					Carbonate content	0.92	Shrink-swell	0.12

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
331B:								
Cherry	Improbable Gravel Source		Poor Bottom layer	0.00	Good		Fair Shrink-swell	0.87
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
Gullied land	Not rated		Not rated		Not rated		Not rated	
Havrelon	Improbable Gravel Source		Poor Bottom layer	0.00	Good		Poor Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
340B:								
Niobell	Improbable Gravel Source		Poor Bottom layer	0.00	Fair Too clayey	0.05	Fair Shrink-swell	0.60
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.60		
	Thickest layer not a source	0.00						
Williams	Improbable Gravel Source		Poor Bottom layer	0.00	Good		Poor Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
341B:								
Noonan	Improbable Gravel Source		Poor Bottom layer	0.00	Poor Salinity	0.00	Poor Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.60	Shrink-swell	0.75
	Thickest layer not a source	0.00						
Niobell	Improbable Gravel Source		Poor Bottom layer	0.00	Fair Too clayey	0.05	Fair Shrink-swell	0.60
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.60		
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
341B:(cont.)								
Williams	Improbable Gravel		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
341C:								
Noonan	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Salinity	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Sodium content	0.60	Shrink-swell	0.75
	Thickest layer not a source	0.00						
Williams	Improbable Gravel		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
403F:								
Rhame	Improbable Gravel		Fair		Poor		Poor	
	Source		Bottom layer	0.01	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Thickest layer	0.01	Depth to bedrock	0.54	Slope	0.00
	Thickest layer not a source	0.00						
Arikara	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Slope	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00					Shrink-swell	1.00
Fleak	Improbable Gravel		Fair		Poor		Poor	
	Source		Thickest layer	0.00	Slope	0.00	Depth to bedrock	0.00
	Bottom layer not a source	0.00	Bottom layer	0.06	Depth to bedrock	0.00	Slope	0.00
	Thickest layer not a source	0.00			Too sandy	0.36		

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
404F:								
Badland, outcrop----	Not rated		Not rated		Not rated		Not rated	
Lambert----------	Improbable Gravel Source		Poor		Fair		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.63	Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.99		
Cabba----------	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.00
							Low strength	0.22
406:								
Glendive, wooded----	Improbable Gravel Source		Fair		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.00	Carbonate content	0.99		
	Thickest layer not a source	0.00	Bottom layer	0.06				
408B:								
Hanly, wooded-------	Improbable Gravel Source		Fair		Fair		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01	Too sandy	0.50		
	Thickest layer not a source	0.00	Bottom layer	0.16				
410:								
Riverwash----------	Not rated		Not rated		Not rated		Not rated	
411B:								
Lambert----------	Improbable Gravel Source		Poor		Good		Fair	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.22
	Thickest layer not a source	0.00	Thickest layer	0.00				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
412E:								
Lambert	Improbable Gravel		Poor		Good		Fair	
	Source		Bottom layer	0.00			Low strength	0.22
	Bottom layer not a source	0.00	Thickest layer	0.00				
	Thickest layer not a source	0.00						
Brandenburg	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Rock fragments	0.00	Cobble content	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.00	Slope	0.98
	Thickest layer not a source	0.00						
442F:								
Zahl	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Slope	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00					Shrink-swell	0.87
Williams	Improbable Gravel		Poor		Poor		Poor	
	Source		Bottom layer	0.00	Slope	0.00	Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Slope	0.50
	Thickest layer not a source	0.00					Shrink-swell	0.87
460C:								
Zahl	Improbable Gravel		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						
Williams	Improbable Gravel		Poor		Good		Poor	
	Source		Bottom layer	0.00			Low strength	0.00
	Bottom layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
	Thickest layer not a source	0.00						

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
460C:(cont.)								
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Low strength	0.22
460D:								
Zahl	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.37	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
Cabba	Improbable Gravel Source		Poor		Poor		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00	Slope	0.37	Low strength	0.22
Williams	Improbable Gravel Source		Poor		Fair		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00	Slope	0.37	Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
470C:								
Zahl	Improbable Gravel Source		Poor		Good		Poor	
	Bottom layer not a source	0.00	Bottom layer	0.00			Low strength	0.00
	Thickest layer not a source	0.00	Thickest layer	0.00			Shrink-swell	0.87
Tally	Improbable Gravel Source		Fair		Good		Good	
	Bottom layer not a source	0.00	Thickest layer	0.01				
	Thickest layer not a source	0.00	Bottom layer	0.02				

Construction Materials--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand		Potential source of topsoil		Potential source of roadfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
470C:(cont.)								
Williams	Improbable Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Good		Poor Low strength Shrink-swell	 0.00 0.87
470D:								
Zahl	Improbable Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Slope	 0.37	Poor Low strength Shrink-swell	 0.00 0.87
Beisigl	Improbable Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Fair Bottom layer Thickest layer	 0.02 0.02	Fair Too sandy Slope Depth to bedrock	 0.36 0.37 0.54	Poor Depth to bedrock	 0.00
Tally	Improbable Source Bottom layer not a source Thickest layer not a source	 0.00 0.00	Fair Thickest layer Bottom layer	 0.01 0.02	Fair Slope	 0.37	Good	
490:								
Riverwash	Not rated		Not rated		Not rated		Not rated	
496:								
Pits, gravel and sand, low precipitation	Not rated		Not rated		Not rated		Not rated	
M-W:								
Miscellaneous water	Not rated		Not rated		Not rated		Not rated	
W:								
Water	Not rated		Not rated		Not rated		Not rated	

Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2:							
Heil	65	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.43	Depth to saturated zone	1.00	Slow refill	0.57
						Salty water	0.50
				Hard to pack	1.00	Cutbanks cave	0.10
				Ponding	1.00		
				Salinity	0.12		
3:							
Dimmick	61	Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Ponding	1.00		
				Hard to pack	0.48		
5:							
Tonka	52	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.46	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
				Ponding	1.00		
				Piping	0.13		
Hamerly	22	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	0.87	Slow refill	0.95
						Cutbanks cave	0.10
				Piping	0.55	Depth to water	0.06
7:							
Harriet	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Salty water	0.78
						Slow refill	0.28
				Piping	1.00	Cutbanks cave	0.10
				Salinity	0.50		
9:							
Grano	50	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Slow refill	1.00
						Cutbanks cave	0.10
				Ponding	1.00		
				Hard to pack	0.87		
10:							
Banks	62	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.33	Cutbanks cave	1.00
						Depth to water	0.90
10D:							
Seroco	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.32	No ground water	1.00
Lohler	10	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Slow refill	1.00
						Depth to water	0.90
						Cutbanks cave	0.10

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
11B:							
Patent	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.72	No ground water	1.00
12:							
Trembles	77	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.12	No ground water	1.00
13:							
Havrelon	73	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.71	No ground water	1.00
14:							
Channel	40	Not limited		Not rated		Not rated	
Korchea	52	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.56	No ground water	1.00
15:							
Korchea	71	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.56	No ground water	1.00
16:							
Ridgelawn	58	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.85	Cutbanks cave	1.00
				Piping	0.70	Depth to water	0.90
				Seepage	0.09		
17:							
Lohler	93	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Slow refill	1.00
						Depth to water	0.90
						Cutbanks cave	0.10
19:							
Hoffmanville	74	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Hard to pack	0.88	Cutbanks cave	1.00
				Thin layer	0.85	Depth to water	0.90
20:							
Scorio	76	Very limited		Very limited		Very limited	
		Seepage	1.00	Hard to pack	1.00	Cutbanks cave	1.00
				Thin layer	0.85	Depth to water	0.90
21B:							
Tally	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
Parshall	28	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.05	No ground water	1.00
21C:							
Tally	61	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
Parshall	19	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.05	No ground water	1.00

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
22:							
Velva	75	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
				Seepage	0.01		
23B:							
Lihen	38	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.64	No ground water	1.00
Parshall	15	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.05	No ground water	1.00
23D:							
Beisigl	41	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.02		
		Slope	0.01				
Telfer	31	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.25	No ground water	1.00
		Slope	0.01				
24:							
Arnegard	68	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.65	No ground water	1.00
25:							
Farnuf	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.51	No ground water	1.00
25B:							
Farnuf	58	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.51	No ground water	1.00
25C:							
Farnuf	67	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.51	No ground water	1.00
26:							
Tansem	64	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.97	No ground water	1.00
Roseglen	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.82	No ground water	1.00
26B:							
Tansem	74	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.97	No ground water	1.00
Roseglen	15	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.82	No ground water	1.00
27:							
Golva	67	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.53	No ground water	1.00
27B:							
Golva	62	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.53	No ground water	1.00

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27C:							
Golva	67	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.53	No ground water	1.00
29:							
Savage	61	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Hard to pack	0.10	No ground water	1.00
29B:							
Savage	67	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Hard to pack	0.10	No ground water	1.00
29C:							
Savage	58	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Hard to pack	0.10	No ground water	1.00
30:							
Lawther	77	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Hard to pack	0.99	No ground water	1.00
				Salinity	0.50		
31B:							
Cherry	76	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Piping	0.15	No ground water	1.00
31C:							
Cherry	68	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Piping	0.15	No ground water	1.00
32F:							
Cherry	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.12	Piping	0.15	No ground water	1.00
		Seepage	0.01				
Cabba	29	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.41	Piping	0.58		
		Seepage	0.02				
33:							
Belfield	49	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Slow refill	1.00
				Salinity	0.12	Depth to water	0.90
						Salty water	0.50
						Cutbanks cave	0.10
Grail	26	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.01			Slow refill	0.99
						Depth to water	0.90
						Cutbanks cave	0.10
33B:							
Belfield	42	Not limited		Very limited		Very limited	
				Hard to pack	1.00	No ground water	1.00
				Salinity	0.12		
Savage	34	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Hard to pack	0.10	No ground water	1.00

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
34B:							
Daglum	52	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.54	Hard to pack	1.00	Depth to water	0.90
				Salinity	0.12	Salty water	0.50
						Slow refill	0.46
						Cutbanks cave	0.10
Belfield	17	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.99	Slow refill	1.00
				Salinity	0.12	Depth to water	0.90
						Salty water	0.50
						Cutbanks cave	0.10
36B:							
Rhoades	55	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.44	Hard to pack	1.00	Depth to water	0.90
				Salinity	0.12	Slow refill	0.56
						Salty water	0.50
						Cutbanks cave	0.10
Daglum	33	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.44	Hard to pack	1.00	Depth to water	0.90
				Salinity	0.12	Slow refill	0.56
						Salty water	0.50
						Cutbanks cave	0.10
38B:							
Dogtooth	59	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	1.00	No ground water	1.00
		Seepage	0.01	Salinity	0.12		
Janesburg	27	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		
38F:							
Dogtooth	33	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	1.00	No ground water	1.00
		Slope	0.04	Salinity	0.12		
		Seepage	0.01				
Janesburg	22	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		
		Slope	0.04				
Cabba	20	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.12	Piping	0.58		
		Seepage	0.02				
40B:							
Desart	24	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
				Salinity	0.12		
				Seepage	0.05		
Janesburg	16	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40B:(cont.)							
Ekalaka	22	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
				Salinity	0.50		
				Seepage	0.08		
41:							
Williams	47	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
Bowbells	37	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Piping	0.54	Slow refill	0.95
						Depth to water	0.90
						Cutbanks cave	0.10
41B:							
Williams	60	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
Bowbells	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Piping	0.54	Slow refill	0.95
						Depth to water	0.90
						Cutbanks cave	0.10
42B:							
Williams	49	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
Zahl	27	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
42C:							
Williams	58	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
43C:							
Williams	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
Zahl	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
44D:							
Zahl	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.01				
Williams	21	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
		Slope	0.01				
44E:							
Zahl	46	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.12				
Williams	30	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
		Slope	0.12				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
45F:							
Zahl	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Piping	0.53	No ground water	1.00
		Seepage	0.70				
Cabba	21	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Maschetah	17	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.53	No ground water	1.00
46B:							
Dooley	41	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.04	No ground water	1.00
				Seepage	0.02		
Zahl	12	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
46C:							
Dooley	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.04	No ground water	1.00
				Seepage	0.02		
Zahl	22	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
46D:							
Dooley	31	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.04	No ground water	1.00
		Slope	0.01	Seepage	0.02		
Zahl	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.01				
48:							
Temvik	51	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.55	No ground water	1.00
Wilton	38	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.67	No ground water	1.00
49:							
Temvik	47	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.55	No ground water	1.00
Williams	38	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.27	No ground water	1.00
49B:							
Temvik	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.55	No ground water	1.00
Williams	16	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.27	No ground water	1.00

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
50B:							
Temvik	48	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.55	No ground water	1.00
Zahl	26	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
51B:							
Amor	67	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.65		
Shambo	15	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.56	No ground water	1.00
51C:							
Amor	39	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.65		
Cabba	29	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
51D:							
Amor	42	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.65		
		Slope	0.01				
Cabba	29	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
		Slope	0.01				
52B:							
Reeder	49	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.60		
Farnuf	16	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.51	No ground water	1.00
52C:							
Reeder	34	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.60		
Cabba	16	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
53B:							
Chama	43	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.58		
Sen	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.58		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
53B:(cont.)							
Cabba	14	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
53C:							
Chama	40	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.58		
Cabba	28	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
Sen	17	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.58		
53D:							
Cabba	38	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
		Slope	0.01				
Chama	26	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.58		
		Slope	0.01				
Sen	16	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.58		
		Slope	0.01				
54F:							
Cabba	45	Somewhat limited		Very limited		Very limited	
		Slope	0.94	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Sen	18	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Slope	0.12	Piping	0.58		
		Depth to bedrock	0.11				
Chama	15	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Slope	0.50	Piping	0.58		
		Depth to bedrock	0.11				
55B:							
Sen	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.58		
Janesburg	34	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
56B:							
Lefor	78	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11				
56C:							
Lefor	65	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11				
61D:							
Beisigl	42	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.02		
		Slope	0.01				
Flasher	28	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.72	Thin layer	1.00	No ground water	1.00
		Seepage	0.43	Seepage	0.06		
		Slope	0.01				
61F:							
Beisigl	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.64	Seepage	0.02		
		Depth to bedrock	0.11				
Flasher	30	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.72	Thin layer	1.00	No ground water	1.00
		Slope	0.64	Seepage	0.06		
		Seepage	0.43				
Tally	17	Very limited		Not limited		Very limited	
		Seepage	1.00			No ground water	1.00
62F:							
Flasher	35	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.72	Seepage	0.06		
		Seepage	0.43				
Rock outcrop	22	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	1.00				
Vebar	13	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.81	No ground water	1.00
		Slope	0.64	Seepage	0.01		
		Depth to bedrock	0.08				
63B:							
Vebar	44	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
Flasher	12	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.72	Thin layer	1.00	No ground water	1.00
		Seepage	0.43	Seepage	0.06		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
63C:							
Vebar	54	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
Flasher	10	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.72	Thin layer	1.00	No ground water	1.00
		Seepage	0.43	Seepage	0.06		
63D:							
Vebar	32	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
		Slope	0.01				
Flasher	16	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.72	Thin layer	1.00	No ground water	1.00
		Seepage	0.43	Seepage	0.06		
		Slope	0.01				
Tally	15	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
		Slope	0.01				
66B:							
Manning	66	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.79	No ground water	1.00
				Seepage	0.01		
70B:							
Regent	71	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.86	No ground water	1.00
		Seepage	0.01	Hard to pack	0.06		
Savage	15	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Hard to pack	0.10	No ground water	1.00
70C:							
Regent	43	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.86	No ground water	1.00
		Seepage	0.01	Hard to pack	0.06		
Cabba	20	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
71B:							
Regent	38	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.86	No ground water	1.00
		Seepage	0.01	Hard to pack	0.06		
Janesburg	28	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		
71C:							
Regent	32	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.86	No ground water	1.00
		Seepage	0.01	Hard to pack	0.06		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
71C:(cont.)							
Janesburg	31	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		
72B:							
Moreau	46	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	0.99	No ground water	1.00
				Thin layer	0.86		
				Salinity	0.03		
72C:							
Moreau	46	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	0.99	No ground water	1.00
				Thin layer	0.86		
				Salinity	0.03		
Wayden	17	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
				Hard to pack	0.78		
				Salinity	0.03		
72D:							
Moreau	30	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	0.99	No ground water	1.00
		Slope	0.01	Thin layer	0.86		
				Salinity	0.03		
Cabba	27	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
		Slope	0.01				
80:							
Badland, high precipitation	90	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
83F:							
Cabba	46	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Badland, outcrop	36	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
84F:							
Cabba	25	Somewhat limited		Very limited		Very limited	
		Slope	0.82	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Chama	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Slope	0.15	Piping	0.58		
		Depth to bedrock	0.11				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
84F:(cont.)							
Havrelon	14	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.71	No ground water	1.00
88D:							
Brandenburg	39	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.01	Seepage	0.75		
				Content of large stones	0.09		
Searing	21	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.85	No ground water	1.00
				Piping	0.82		
				Seepage	0.05		
Dogtooth	12	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	1.00	No ground water	1.00
		Seepage	0.01	Salinity	0.12		
		Slope	0.01				
88F:							
Brandenburg	38	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.94	Seepage	0.75		
				Content of large stones	0.09		
Cabba	17	Somewhat limited		Very limited		Very limited	
		Slope	0.94	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Dogtooth	12	Somewhat limited		Very limited		Very limited	
		Slope	0.12	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		
		Seepage	0.01				
89F:							
Brandenburg	28	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.88	Seepage	0.75		
				Content of large stones	0.09		
Cabba	22	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Badland, outcrop	16	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
90E:							
Manning	24	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.79	No ground water	1.00
				Seepage	0.01		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
90E:(cont.)							
Schaller	22	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.14	No ground water	1.00
		Slope	0.04				
Wabek	22	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.06	Seepage	0.61		
91F:							
Wabek	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.61	No ground water	1.00
		Slope	0.18				
Zahl	27	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.18				
93B:							
Lehr	37	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
				Piping	0.86		
				Seepage	0.61		
Stady	27	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.87	No ground water	1.00
				Thin layer	0.85		
				Seepage	0.61		
94B:							
Searing	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.85	No ground water	1.00
				Piping	0.82		
				Seepage	0.05		
Ringling	19	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
				Seepage	0.75		
95:							
Havrelon	96	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Piping	0.02	Depth to water	0.90
						Slow refill	0.30
						Cutbanks cave	0.10
96:							
Pits, gravel and sand	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.79	No ground water	1.00
		Slope	0.50				
98F:							
Tinsley	53	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.15	Seepage	0.07		
Chanta	17	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.94	No ground water	1.00
		Slope	0.01	Thin layer	0.85		
				Seepage	0.64		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
99:							
Mckeen	73	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Piping	0.63		
100F:							
Boxwell	34	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Slope	0.50	Piping	0.76		
		Depth to bedrock	0.11				
Cabbart	32	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.50	Piping	0.63		
		Seepage	0.02				
Arikara	16	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.69	No ground water	1.00
		Slope	0.64				
101F:							
Cabbart	41	Somewhat limited		Very limited		Very limited	
		Slope	0.82	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.63		
		Seepage	0.02				
Badland, outcrop	27	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
102B:							
Kremlin	26	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.57	No ground water	1.00
Ethridge	22	Not limited		Not limited		Very limited	
						No ground water	1.00
Gerda	19	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
				Salinity	0.12		
103B:							
Chinook	42	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
Rhame	28	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
103D:							
Rhame	42	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
		Slope	0.01				
Chinook	32	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
		Slope	0.01				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
103F:							
Rhame	29	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.64	Seepage	0.01		
		Depth to bedrock	0.11				
Fleak	27	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.72	Thin layer	1.00	No ground water	1.00
		Slope	0.64	Seepage	0.06		
		Seepage	0.46				
104E:							
Badland, outcrop	54	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Patent	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.72	No ground water	1.00
		Slope	0.01				
105:							
Havre	77	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.56	No ground water	1.00
106:							
Glendive	70	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
107:							
Kremlin	77	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.57	No ground water	1.00
108B:							
Hanly	81	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.16	No ground water	1.00
109:							
Havre, wooded	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.56	No ground water	1.00
110B:							
Maltese	39	Very limited		Very limited		Very limited	
		Seepage	1.00	Hard to pack	1.00	No ground water	1.00
				Salinity	0.12		
Gerda	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
				Salinity	0.12		
111D:							
Gerda	16	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
				Salinity	0.12		
Kirby	23	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.01	Seepage	1.00		
				Content of large stones	0.01		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
111F:							
Kirby	49	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.88	Seepage	1.00		
				Content of large stones	0.01		
Scairt	16	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	1.00	No ground water	1.00
		Slope	0.06	Salinity	0.12		
		Seepage	0.04				
112F:							
Kirby	39	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.88	Seepage	1.00		
				Content of large stones	0.01		
Badland, outcrop	23	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Patent	13	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.72	No ground water	1.00
		Slope	0.12				
113F:							
Lonna	34	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	No ground water	1.00
		Slope	0.01				
Cabbart	33	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.15	Piping	0.63		
		Seepage	0.02				
114:							
Channel	40	Not limited		Not rated		Not rated	
Glendive	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
Havre	18	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.56	No ground water	1.00
115F:							
Badland, outcrop	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Arikara	28	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.69	No ground water	1.00
		Seepage	0.72				
Cabbart	16	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.63		
		Seepage	0.02				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
116F:							
Kremlin	19	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.57	No ground water	1.00
		Slope	0.01				
Cabbart	29	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.28	Piping	0.63		
		Seepage	0.02				
117:							
Wolf Point	85	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.96	No ground water	1.00
118F:							
Lonna	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	No ground water	1.00
		Slope	0.03				
Kirby	34	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.41	Seepage	1.00		
				Content of large stones	0.01		
Cabbart	16	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.41	Piping	0.63		
		Seepage	0.02				
119F:							
Patent	33	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.72	No ground water	1.00
		Slope	0.01				
Badland, outcrop	21	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Cabbart	21	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.50	Piping	0.63		
		Seepage	0.02				
121F:							
Maltese	25	Very limited		Very limited		Very limited	
		Seepage	1.00	Hard to pack	1.00	No ground water	1.00
				Salinity	0.12		
Lonna	24	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	No ground water	1.00
		Slope	0.03				
Arikara	22	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.69	No ground water	1.00
		Slope	0.64				
127:							
Maschetah	82	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.53	No ground water	1.00

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
127B:							
Maschetah	87	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.53	No ground water	1.00
127C:							
Maschetah	70	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.53	No ground water	1.00
131B:							
Lonna	87	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	No ground water	1.00
131C:							
Lonna	64	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	No ground water	1.00
132C:							
Patent	38	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.72	No ground water	1.00
Gerda	27	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
				Salinity	0.12		
Slickspots	10	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.43	Piping	0.78	No ground water	1.00
138E:							
Scairt	31	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	1.00	No ground water	1.00
		Seepage	0.04	Salinity	0.12		
		Slope	0.01				
Maltese	22	Very limited		Very limited		Very limited	
		Seepage	1.00	Hard to pack	1.00	No ground water	1.00
		Slope	0.02	Salinity	0.12		
Boxwell	10	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.76		
		Slope	0.01				
145F:							
Zahl	23	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Piping	0.53	No ground water	1.00
		Seepage	0.70				
Cabba	21	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Arikara	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.69	No ground water	1.00
		Seepage	0.72				
146B:							
Dooley	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.04	No ground water	1.00
				Seepage	0.02		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
151B:							
Boxwell	46	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.76		
Kremlin	43	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.57	No ground water	1.00
151D:							
Boxwell	38	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.76		
		Slope	0.01				
Kremlin	28	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.57	No ground water	1.00
		Slope	0.01				
154F:							
Arikara	33	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.69	No ground water	1.00
		Seepage	0.72				
Shambo	21	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.56	No ground water	1.00
		Slope	0.18				
Cabba	18	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
161F:							
Beisigl	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.64	Seepage	0.02		
		Depth to bedrock	0.11				
Flasher	30	Somewhat limited		Very limited		Very limited	
		Slope	0.94	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.72	Seepage	0.02		
		Seepage	0.70				
Arikara	24	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.77	No ground water	1.00
		Seepage	0.72				
164D:							
Vebar, extremely stony	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
171:							
Lohler, moderately saline	86	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Slow refill	1.00
				Salinity	0.50	Depth to water	0.90
						Salty water	0.78
						Cutbanks cave	0.10

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
180:							
Badland	88	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
183F:							
Badland, outcrop	51	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Cabba	32	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
187F:							
Arikara	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.69	No ground water	1.00
		Seepage	0.72				
Cabbart	26	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.63		
		Seepage	0.02				
193B:							
Chanta	81	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.94	No ground water	1.00
				Thin layer	0.85		
				Seepage	0.64		
194F:							
Kirby	42	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.94	Seepage	1.00		
				Content of large stones	0.01		
Arikara	27	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.69	No ground water	1.00
		Seepage	0.72				
Badland, outcrop	16	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
195:							
Havrelon	42	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.03	Piping	0.53	Slow refill	0.97
				Salinity	0.50	Depth to water	0.90
						Salty water	0.78
						Cutbanks cave	0.10

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
199:							
Mckeen	78	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Cutbanks cave	1.00
				Depth to saturated zone	1.00		
				Piping	0.63		
201F:							
Badland, outcrop	63	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Cabbart	30	Somewhat limited		Very limited		Very limited	
		Slope	0.82	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.63		
		Seepage	0.02				
202D:							
Boxwell	27	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Piping	0.76		
		Slope	0.01				
Scairt	18	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	1.00	No ground water	1.00
		Seepage	0.04	Salinity	0.12		
		Slope	0.01				
Maltese	14	Very limited		Very limited		Very limited	
		Seepage	1.00	Hard to pack	1.00	No ground water	1.00
		Slope	0.01	Salinity	0.12		
203D:							
Rhame	23	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
Kremlin	16	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.57	No ground water	1.00
Maltese	15	Very limited		Very limited		Very limited	
		Seepage	1.00	Hard to pack	1.00	No ground water	1.00
				Salinity	0.12		
203F:							
Rhame	40	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.28	Seepage	0.02		
		Depth to bedrock	0.11				
Scairt	22	Somewhat limited		Very limited		Very limited	
		Slope	0.12	Piping	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		
		Seepage	0.04				
Kremlin	13	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.59	No ground water	1.00
		Slope	0.12				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
205:							
Havre, rarely flooded	89	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.56	No ground water	1.00
206:							
Glendive, rarely flooded	84	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
207:							
Harriet	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Salty water	0.78
						Slow refill	0.28
				Piping	1.00	Cutbanks cave	0.10
				Salinity	0.50		
211F:							
Cabba	40	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
Badland, outcrop	34	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Arikara	24	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.69	No ground water	1.00
		Seepage	0.72				
212:							
Trembles	70	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.12	Cutbanks cave	1.00
						Depth to water	0.90
213:							
Havrelon, slightly wet	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Piping	0.71	Depth to water	0.90
						Slow refill	0.30
						Cutbanks cave	0.10
214:							
Channel	40	Not limited		Not rated		Not rated	
Korchea, wooded	52	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.56	No ground water	1.00
217:							
Wolf Point, wooded	78	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.96	No ground water	1.00
218F:							
Cherry	23	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Piping	0.15	No ground water	1.00
		Slope	0.01				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
218F:(cont.)							
Cabba	22	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.18	Piping	0.58		
		Seepage	0.02				
Brandenburg	16	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.18	Seepage	0.75		
				Content of large stones	0.09		
227:							
Haydraw	84	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Piping	0.53	No ground water	1.00
227B:							
Haydraw	72	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Piping	0.53	No ground water	1.00
231C:							
Patent	32	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.72	No ground water	1.00
Gullied land	19	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
		Slope	1.00	Thin layer	0.99		
		Depth to bedrock	0.45	Salinity	0.03		
Glendive	13	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
232C:							
Lambert	41	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.63	No ground water	1.00
Slickspots	21	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.43	Piping	0.78	No ground water	1.00
Rhoades	15	Somewhat limited		Very limited		Very limited	
		Seepage	0.44	Hard to pack	1.00	No ground water	1.00
				Salinity	0.12		
238B:							
Janesburg	40	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		
Dogtooth	29	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.11	Hard to pack	1.00	No ground water	1.00
		Seepage	0.01	Salinity	0.12		
239D:							
Vebar	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.01		
Janesburg	19	Somewhat limited		Very limited		Very limited	
		Seepage	0.47	Hard to pack	1.00	No ground water	1.00
		Depth to bedrock	0.11	Salinity	0.12		

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
242F:							
Zahl	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.36				
Williams	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
		Slope	0.28				
Arikara	15	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.69	No ground water	1.00
		Slope	0.50				
287F:							
Arikara	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Piping	0.69	No ground water	1.00
		Seepage	0.72				
Cabba	26	Somewhat limited		Very limited		Very limited	
		Slope	0.94	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.66	Piping	0.58		
		Seepage	0.02				
299:							
Minnewaukan	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Ponding	1.00		
				Seepage	0.22		
Banks	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.25	No ground water	1.00
Riverwash	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Seepage	0.91		
317:							
Lallie	85	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Slow refill	1.00
				Ponding	1.00	Cutbanks cave	0.10
				Hard to pack	0.50	Salty water	0.01
331B:							
Cherry	33	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Piping	0.15	No ground water	1.00
Gullied land	21	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
		Slope	1.00	Thin layer	0.99		
		Depth to bedrock	0.45	Salinity	0.03		
Havrelon	16	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.71	No ground water	1.00

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
340B:							
Niobell	42	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.05	Piping	0.95	Slow refill	0.95
						Depth to water	0.90
						Cutbanks cave	0.10
						Salty water	0.01
Williams	27	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
341B:							
Noonan	39	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.01	Piping	1.00	Slow refill	0.99
				Salinity	0.12	Depth to water	0.90
						Salty water	0.50
						Cutbanks cave	0.10
Niobell	31	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.05	Piping	0.95	Slow refill	0.95
						Depth to water	0.90
						Cutbanks cave	0.10
						Salty water	0.01
Williams	23	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
341C:							
Noonan	23	Somewhat limited		Very limited		Very limited	
		Seepage	0.01	Piping	1.00	No ground water	1.00
				Salinity	0.12		
Williams	22	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
403F:							
Rhame	24	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.64	Seepage	0.01		
		Depth to bedrock	0.11				
Arikara	23	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.69	No ground water	1.00
		Slope	0.64				
Fleak	16	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.72	Thin layer	1.00	No ground water	1.00
		Slope	0.64	Seepage	0.06		
		Seepage	0.46				
404F:							
Badland, outcrop	42	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	0.99	Piping	1.00		
		Seepage	0.01	Salinity	0.03		
Lambert	34	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.63	No ground water	1.00
		Slope	0.01				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
404F:(cont.)							
Cabba	12	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Slope	0.50	Piping	0.58		
		Seepage	0.02				
406:							
Glendive, wooded	74	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
408B:							
Hanly, wooded	61	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.16	No ground water	1.00
410:							
Riverwash	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Seepage	0.91		
411B:							
Lambert	81	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.63	No ground water	1.00
412E:							
Lambert	37	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.63	No ground water	1.00
Brandenburg	26	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.04	Seepage	0.75		
				Content of large stones	0.09		
442F:							
Zahl	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.50				
Williams	24	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
		Slope	0.12				
460C:							
Zahl	28	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
Williams	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
Cabba	19	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
460D:							
Zahl	32	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.01				

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
460D:(cont.)							
Cabba	24	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	No ground water	1.00
		Seepage	0.02	Piping	0.58		
		Slope	0.01				
Williams	13	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
		Slope	0.01				
470C:							
Zahl	31	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
Tally	18	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
Williams	16	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.29	No ground water	1.00
470D:							
Zahl	31	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.53	No ground water	1.00
		Slope	0.01				
Beisigl	27	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Depth to bedrock	0.11	Seepage	0.02		
		Slope	0.01				
Tally	15	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	No ground water	1.00
		Slope	0.01				
490:							
Riverwash	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Seepage	0.91		
496:							
Pits, gravel and sand, low precipitation	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.79	No ground water	1.00
		Slope	0.50				
M-W:							
Miscellaneous water	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are determined by or estimated from the field examination of the soils and by laboratory testing. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine physical and chemical soil properties. Standard laboratory procedures are followed. Information from the laboratory and results from samples from similar soils in nearby areas are used to verify field observations and properties that cannot be estimated accurately in the field. The laboratory analyses also help to characterize key soils.

Estimates of soil properties shown in tables include the range of soil texture, Atterberg limits, engineering classifications, and other physical and chemical properties of the major layers of each soil. Pertinent soil and water features are also given.

Each soil map unit was documented by at least one pedon description for each soil series identified in its name. Pedons were sampled for engineering properties. The analyses were made by the North Dakota State Department of Transportation.

Engineering Index Properties

The “Engineering Index Properties” table gives the engineering classifications and the range of index properties for major layers of each named map unit component in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given in the series descriptions in this publication, under the heading “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the “Glossary.”

Classification of the soils is determined according to the Unified soil classification system (American Society for Testing and Materials [ASTM], 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH;

and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and **plasticity index** (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical Properties

The “Physical Properties of the Soils” table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the major layers of each named map unit component in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given in the series descriptions in this publication, under the heading “Soil Series and Their Morphology.”

Clay consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each soil layer is given as a percentage, by weight, of the soil material less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. Clay determines the ability of the soil to adsorb cations and retain moisture. Clay influences shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated range in moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available

water capacity, total pore space, and other soil properties. Moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Ksat (permeability/saturated hydraulic conductivity) refers to the ability of a soil to transmit water or air. The estimates indicate the rate of water movement when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The range in the capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect retention of water and depth of the root zone. The most important soil properties are organic matter content, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain of moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The magnitude of the load on the soil and magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design features are often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are **low**, a change of less than 3 percent; **moderate**, 3 to 6 percent; and **high**, more than 6 percent. **Very high**, more than 9 percent, is sometimes used.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the “Physical Properties of the Soils” table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects available water capacity, infiltration rates, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factor Kw indicates the susceptibility of a soil to sheet and rill erosion by water. Soil properties that influence erodibility are those that affect the infiltration rate, movement of water through the soil, water storage capacity of the soil, and those that allow the soil to resist dispersion, splashing, abrasion, and the transporting forces of rainfall and runoff. The most important soil properties are the content of silt, sand, and organic matter, soil structure, and permeability. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion.

Erosion factor Kf is similar to the erosion factor Kw, except it indicates the erodibility of only the fine-earth fraction, or the material less than 2 millimeters in size.

Soil loss tolerance factor T is an estimate of the maximum annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is expressed in tons per acre per year. Ratings of 1 to 5 are used depending on soil properties and prior erosion. The criteria used in assigning a T factor to a soil include maintenance of an adequate rooting depth for crop production, potential reduction of crop yields, maintenance of water-control structures affected by sedimentation, prevention of gullying, and the value of nutrients lost through erosion.

Wind erodibility groups (WEG) are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

WEG 1. Coarse sands, sands, fine sands, and very fine sands. These soils generally are not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

WEG 2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

WEG 3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

WEG 4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

WEG 4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are highly erodible. Crops can be grown if measures to control wind erosion are used.

WEG 5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

WEG 6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

WEG 7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

WEG 8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index (I) is a numerical value indicating the potential annual soil loss due to wind erosion for a soil under a well defined set of climatic and management conditions. This factor is expressed as the average annual soil loss in tons per acre per year.

Chemical Properties

The “Chemical Properties of the Soils” table shows estimates of some soil chemical properties that affect soil behavior. These estimates are given for the major layers of each named map unit component in the survey area. The estimates are based on test data for these and similar soils. These features are described in the following paragraphs.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given in the series

descriptions in this publication, under the heading “Soil Series and Their Morphology.”

Clay consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material less than 2 millimeters in diameter.

Cation-exchange capacity is the total amount of exchangeable cation that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations helps to prevent pollution of ground water.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the soil. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization. Calcium carbonate also affects susceptibility of a soil to wind erosion.

Gypsum is given as the percent, by weight, of hydrated calcium sulfates in the soil. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum (more than 10 percent) may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity (EC) of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium relative to calcium and magnesium in the water extract from a saturated soil paste. Soils having a sodium adsorption ratio of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

The “Water Features” table gives estimates of several important water features used in land use planning that involves engineering considerations. These features are described in the following paragraphs.

Hydrologic soil groups are groups of soils that have the same runoff potential under similar storm and ground cover conditions. Soil properties that affect the runoff potential are those that influence the rate of infiltration in a bare soil after prolonged wetting and when the soil is not frozen. These properties include the depth to a seasonal high water table, the intake rate, permeability after prolonged wetting, and the depth to a very slowly permeable layer. The influences of ground cover and slope are treated independently and are not taken into account in hydrologic soil groups.

In the definitions of the hydrologic soil groups, the infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The transmission rate is the rate at which water moves through the soil and is controlled by properties of the soil layers.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist mainly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist mainly of soils having a layer that impedes the downward movement of water or soils of moderately fine or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist mainly of clayey soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups, the first letter is for drained areas and the second is for undrained areas.

Months in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table (seasonal) refers to a zone in the soil that is at saturation in most years. It is at least 6 inches thick, persists in the soil for more than a few weeks, and is within 6 feet of the surface. Estimates of water table depths are based mainly on the evidence of a saturated zone that exists in a soil, namely a combination of grayish colors or redoximorphic features. Water tables may either be apparent or perched. An apparent water table is indicated by the level at which water stands in a freshly dug, unlined borehole after adequate time is allowed for adjustment in the surrounding soil. A perched water table is water standing above an unsaturated zone in the soil. A perched water table may be separated from a lower water table by an unsaturated zone. Water tables usually are perched by textural discontinuities in the soil profile. A perched water table may be confirmed if the water level in a borehole falls when the borehole is extended.

Indicated in the “Water Features” table are the **upper limit** and **lower limit** in the depth of the water table found in the soil in most years. These depth ranges are given to the nearest tenth of a foot and are listed by month. If no water table exists in the soil, no information is given.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Ponding of soils is classified according to the depth, duration, frequency, and the beginning and ending months in which water is observed.

Surface water depth is the maximum depth of surface water that is ponded on the soil.

Ponding duration is the average length of time of the ponding occurrence. Ponding duration classes are **very brief** (less than 2 days), **brief** (2 to 7 days), **long** (7 to 30 days), and **very long** (more than 30 days).

Ponding frequency is the number of times ponding occurs over a period of time. Ponding frequency classes are **none** (no reasonable possibility of ponding), **rare** (ponding unlikely but possible under unusual weather conditions; 0 to 5 percent chance of ponding in any year); **occasional** (ponding is expected infrequently under usual weather conditions; 5 to 50 percent chance of ponding in any year); and

frequent (ponding is likely to occur under usual weather conditions; more than 50 percent chance in any year).

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflow from streams or by runoff from adjacent slopes. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in marshes and swamps or in closed depressions is considered to be ponding.

The table gives the **duration** and **frequency** of flooding and the time of year when flooding is most likely to occur. Flooding frequency classes are identical to ponding frequency classes. Flooding duration classes are **extremely brief** (0.1 to 4 hours), **very brief** (4 hours to 48 hours), **brief** (2 to 7 days), **long** (7 to 30 days), and **very long** (more than 30 days). Frequency, duration, and probable dates of occurrence are estimated.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered in making flooding estimates are local information about the extent and level of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

The “Soil Features” table gives estimates of several important soil features used in land use planning that involves engineering considerations. These features are described in the following paragraphs.

Restrictive layers are nearly continuous soil layers that significantly reduce the movement of water and air through the soil or that otherwise provide an unfavorable root environment. Restriction **kind** is the type of restriction. Examples of restrictions include bedrock, cemented layers, and dense layers. Restriction **thickness** is the distance from the top to the bottom of a restrictive layer. Restriction **hardness** refers to the rupture resistance or strength of the layer.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, organic matter content, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly-structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

A **low** potential for frost action indicates that the soil is rarely susceptible to the formation of ice lenses; a **moderate** potential indicates that the soil is susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength; and a **high** potential indicates that the soil is highly susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is

based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil.

Special site examination and design features may be needed if the combination of factors results in a severe hazard of corrosion. Steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

For **uncoated steel**, the risk of corrosion, expressed as **low, moderate,** or **high,** is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For **concrete,** the risk of corrosion also is expressed as **low, moderate,** or **high**. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Hydric Soils

The "Hydric Soils List" shows which map units have components that meet the definition of hydric soils in McKenzie County. This table can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; USDA-NRCS, 1998). Map units that are made up of hydric soils may have small areas or inclusions of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin et al., 1979; Environmental Laboratory, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria which identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 1998) and in the "Soil Survey Manual" (Soil Survey Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators that can be used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (USDA-NRCS, 1998).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described as deep as necessary for an understanding of the redoximorphic processes. Then, using the

completed soil descriptions, soil scientists can compare soil features required by each hydric soil indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if one or more of the approved indicators is present.

This survey can be used to locate probable areas of hydric soils. The hydric soil may have been artificially drained or otherwise altered such that it no longer supports a predominance of hydrophytic vegetation. The soil map does not identify drained areas.

Engineering Index Properties

(The symbol < means less than; > means greater than. Dashes (---) indicate that an assignment has not been made.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
2:												
Heil	0-3	Silty clay	CH	A-7-6, A-7	0	0	100	100	90-100	75-100	50-60	30-35
	3-24	Silty clay, clay	CH, MH	A-7-6	0	0	100	100	90-100	75-100	55-70	25-40
	24-38	Silty clay, clay, silty clay loam, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-95	40-60	15-30
	38-52	Silty clay, clay, silty clay loam, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-95	40-60	15-30
	52-60	Silty clay, silty clay loam, loam, clay, clay loam	CH, ML	A-7-6, A-6	0	0	100	100	85-100	60-95	35-60	10-30
3:												
Dimmick	0-3	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	3-6	Silty clay loam	CH, CL	A-7	0	0	100	100	90-100	75-95	40-55	20-35
	6-23	Silty clay, clay	MH	A-7	0	0	100	100	90-100	75-95	55-65	25-30
	23-63	Clay, silty clay	MH	A-7	0	0	100	100	90-100	75-95	55-75	25-40

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5:												
Tonka	0-13	Silt loam, loam	CL	A-6	0-1	0-2	100	95-100	85-100	60-90	25-35	10-15
	13-19	Loam, silt loam, very fine sandy loam	CL	A-6, A-4	0-1	0-2	100	95-100	85-100	50-90	25-35	8-15
	19-34	Silty clay loam, clay loam, silty clay, clay	MH	A-7-5	0-1	0-2	100	95-100	90-100	70-95	50-60	10-20
	34-50	Clay loam, silty clay loam, clay, silty clay	CH, CL	A-7-6	0-1	0-3	90-100	85-100	60-100	50-90	45-55	20-30
	50-60	Clay loam, silty clay loam, loam, sandy clay loam	CL	A-6, A-7-6	0-1	0-3	90-100	85-100	60-100	50-90	30-50	10-25
Hamerly	0-8	Loam	CL	A-6	0	0-5	95-100	90-100	80-95	60-90	25-35	10-15
	8-25	Loam, clay loam	CL	A-6, A-7, A-7-6	0	0-5	95-100	90-100	80-95	60-75	25-45	10-20
	25-60	Loam, clay loam	CL	A-6, A-7, A-7-6	0	0-5	95-100	90-100	75-95	55-75	25-45	10-20
7:												
Harriet	0-2	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-15
	2-18	Clay loam, silty clay loam, silty clay, clay	CH, CL, ML, MH	A-7	0	0	100	100	90-100	70-100	45-65	20-30
	18-28	Loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-100	30-50	10-25
	28-38	Very fine sandy loam	CL-ML, CL	A-4	0	0	100	100	85-95	50-65	25-30	4-10
	38-40	Clay loam	CL, ML	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	10-20
	40-60	Stratified very fine sandy loam to silty clay	CL, ML, CH	A-6, A-5, A-4, A-7-6	0	0	100	100	90-100	60-100	30-55	7-30

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
9:												
Grano	0-3	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	3-19	Silty clay, clay	CH	A-7, A-7-6	0	0	100	100	95-100	80-95	55-75	30-50
	19-51	Silty clay, clay	CH	A-7, A-7-6	0	0	100	100	95-100	80-95	55-75	30-50
	51-63	Clay loam, silty clay, clay	CL	A-7, A-6, A-7-6	0	0	100	100	90-100	75-95	35-50	15-30
10:												
Banks	0-10	Fine sandy loam, very fine sandy loam	CL-ML, SC	A-4	0	0	100	100	80-95	45-75	20-30	4-10
	10-60	Stratified loamy fine sand, fine sand, sand	SM, SW-SM	A-2-4	0	0	100	100	50-70	10-25	15-20	NP-4
10D:												
Seroco	0-3	Loamy fine sand, loamy sand	SM	A-2, A-2-4	0	0	100	100	50-75	15-30	10-20	NP-4
	3-60	Fine sand, loamy fine sand, loamy sand	SM	A-2, A-2-4	0	0	100	100	65-80	20-35	10-20	NP-4
Lohler	0-8	Silty clay	CH	A-7-6	0	0	100	100	95-100	80-95	55-75	30-50
	8-60	Stratified silty clay, stratified silty clay loam to clay	CH	A-7-6	0	0	100	100	95-100	80-95	50-75	30-50
11B:												
Patent	0-7	Loam, silt loam	CL	A-6	0	0	100	100	70-100	50-85	25-35	10-15
	7-60	Stratified fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	70-100	50-90	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
12:												
Trembles	0-9	Fine sandy loam	SC-SM, CL, CL-ML, SC	A-4	0	0	100	100	70-85	40-55	20-30	4-10
	9-59	Stratified fine sandy loam to silt loam	SC-SM, CL, CL-ML, SC	A-4	0	0	100	100	65-85	35-60	20-30	4-10
	59-80	Stratified sand to silt loam	SC-SM, SM, SC	A-2-4, A-4	0	0	100	100	50-70	10-40	15-30	1-10
13:												
Havrelon	0-13	Silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	13-60	Stratified very fine sandy loam to silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	85-100	60-80	25-45	7-20
14:												
Channel	---	---	---	---	---	---	---	---	---	---	---	---
Korchea	0-6	Silty clay loam, silt loam, fine sandy loam, stratified loam	CL, SC	A-4, A-6, A-7-6	0	0	95-100	95-100	70-100	40-95	20-45	4-20
	6-60	Stratified fine sandy loam to silty clay loam	CL, SC	A-6, A-7-6	0	0	95-100	95-100	70-100	40-95	25-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
15:												
Korchea---------	0-6	Loam, stratified loam to silty clay loam	CL, SC	A-4, A-6, A-7-6	0	0	95-100	95-100	70-100	40-95	20-45	4-20
	6-60	Stratified fine sandy loam to silty clay loam	CL, SC	A-6, A-7-6	0	0	95-100	95-100	70-100	40-95	25-45	10-20
16:												
Ridgelawn-------	0-9	Silt loam	CL	A-6	0	0	100	100	85-95	65-80	25-35	10-15
	9-29	Stratified loam to silty clay loam	CL	A-7-6, A-6, A-7	0	0	100	100	80-95	60-85	25-45	10-20
	29-80	Stratified sand to loamy fine sand, gravelly fine sand, stratified gravelly loamy sand	SM	A-2-4, A-1-b, A-2, A-3	0	0	65-100	50-100	30-75	5-35	10-20	NP-4
17:												
Lohler----------	0-8	Silty clay	CH	A-7-6	0	0	100	100	95-100	80-95	55-75	30-50
	8-60	Stratified silty clay, stratified silty clay loam to clay	CH	A-7-6	0	0	100	100	95-100	80-95	50-75	30-50

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
19:												
Hoffmanville----	0-8	Silty clay, clay	CH	A-7-6, A-7	0	0	100	100	90-100	85-95	55-75	30-50
	8-26	Stratified silty clay loam to silty clay, silty clay	CH	A-7-6, A-7	0	0	100	100	90-100	80-95	50-75	30-50
	26-50	Loamy fine sand, stratified loamy fine sand to fine sandy loam, gravelly loamy fine sand	SC-SM, SM, SP-SM	A-1-b, A-2-4, A-4	0	0	65-100	50-100	40-90	5-40	15-30	1-10
	50-61	Stratified silty clay loam to silty clay, silty clay loam	CH, CL	A-7-6, A-7, A-6	0	0	100	100	90-100	85-95	35-60	15-30
	61-80	Fine sandy loam, stratified fine sandy loam to silt loam	SC, CL, CL-ML	A-4, A-2-4, A-6	0	0	100	100	70-100	30-90	20-35	4-15
20:												
Scorio----------	0-8	Silty clay	CH	A-7, A-7-6	0	0	100	100	95-100	80-95	55-75	30-50
	8-32	Silty clay, silty clay loam	CH	A-7-6, A-7	0	0	100	100	90-100	80-95	50-75	30-50
	32-60	Stratified loam to very fine sand	ML, SM, CL-ML, CL	A-2, A-4	0	0	100	100	75-95	30-75	15-30	NP-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
21B:												
Tally----------	0-6	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	55-100	25-55	20-30	4-10
	6-32	Fine sandy loam, sandy loam	SC, SC-SM, CL-ML, CL	A-2-4, A-4	0	0	90-100	80-100	60-100	25-50	20-30	4-10
	32-60	Fine sandy loam, sandy loam, loamy fine sand	SC, SC-SM, CL-ML, CL, SM, ML	A-2-4, A-4	0	0	90-100	80-100	60-100	15-50	15-30	1-10
Parshall--------	0-12	Fine sandy loam, sandy loam	CL-ML, CL, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-85	30-55	20-30	4-10
	12-29	Fine sandy loam	CL-ML, CL, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-85	30-55	20-30	4-10
	29-48	Fine sandy loam, loamy sand, sandy loam	CL-ML, ML, SC, SM, SC-SM, CL	A-2-4, A-4	0	0	100	100	60-85	25-55	15-30	1-10
	48-60	Loamy fine sand, fine sandy loam, sandy loam, loamy sand	CL-ML, ML, SC, SC-SM, CL	A-2-4, A-4	0	0	100	100	60-85	25-55	15-30	1-10
21C:												
Tally----------	0-6	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	55-100	25-55	20-30	4-10
	6-32	Fine sandy loam, sandy loam	SC, SC-SM, CL-ML, CL	A-4, A-2-4	0	0	90-100	80-100	60-100	25-50	20-30	4-10
	32-60	Fine sandy loam, sandy loam, loamy fine sand	SC, SC-SM, CL-ML, CL, ML, SM	A-2-4, A-4	0	0	90-100	80-100	60-100	15-50	15-30	1-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
21C:(cont.)												
Parshall	0-12	Fine sandy loam, sandy loam	CL-ML, CL, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-85	30-55	20-30	4-10
	12-29	Fine sandy loam	CL-ML, CL, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-85	30-55	20-30	4-10
	29-48	Fine sandy loam, loamy sand, sandy loam	CL-ML, ML, SC, SC-SM, CL	A-2-4, A-4	0	0	100	100	60-85	25-55	15-30	1-10
	48-60	Loamy fine sand, fine sandy loam, sandy loam, loamy sand	CL-ML, ML, SC, SC-SM, CL	A-2-4, A-4	0	0	100	100	60-85	25-55	15-30	1-10
22:												
Velva	0-6	Fine sandy loam, sandy loam, very fine sandy loam	CL-ML, CL, SC-SM, SC	A-4	0	0	100	100	60-95	35-65	20-30	4-10
	6-13	Fine sandy loam, very fine sandy loam, loam	SC, CL, SC-SM, CL-ML	A-4	0	0	100	100	60-95	30-65	20-30	4-10
	13-60	Stratified very fine sandy loam to loam	CL-ML, CL, SC-SM, SC	A-4	0	0	100	100	70-95	40-75	20-30	4-10
23B:												
Lihen	0-9	Loamy fine sand, loamy sand, sand	SM	A-2-4	0	0	100	100	50-90	15-35	10-20	NP-4
	9-24	Loamy sand, loamy fine sand, sand	SM	A-2-4	0	0	100	100	50-90	15-35	10-20	NP-4
	24-32	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4	0	0	100	100	50-90	15-35	10-20	NP-4
	32-60	Sand, fine sand, loamy fine sand, loamy sand	SM	A-2-4	0	0	100	100	50-90	15-35	10-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
23B:(cont.)												
Parshall--------	0-12	Fine sandy loam, sandy loam	CL-ML, CL, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-85	30-55	20-30	4-10
	12-29	Fine sandy loam	CL, SC-SM, CL-ML, SC	A-2-4, A-4	0	0	100	100	60-85	30-55	20-30	4-10
	29-48	Fine sandy loam, loamy sand, sandy loam	CL-ML, ML, SC, CL, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	25-55	15-30	1-10
	48-60	Loamy fine sand, fine sandy loam, sandy loam, loamy sand	CL-ML, ML, SC, CL, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	25-55	15-30	1-10
23D:												
Beisigl---------	0-5	Loamy fine sand, loamy sand	SM	A-2-4, A-4	0	0	95-100	85-100	75-95	20-40	15-20	NP-4
	5-27	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	95-100	85-100	50-100	15-35	15-20	NP-4
	27-60	Bedrock			---	---	---	---	---	---	15-20	NP-4
Telfer----------	0-6	Loamy fine sand, loamy sand	SM, SC-SM	A-2-4	0	0	100	100	50-80	15-35	10-20	NP-4
	6-60	Fine sand, loamy fine sand, loamy sand	SM, SC-SM	A-2-4	0	0	100	100	50-80	15-35	10-20	NP-4
24:												
Arnegard--------	0-13	Loam	CL	A-6	0	0	100	100	85-95	60-85	25-35	10-15
	13-36	Loam, silt loam, clay loam	CL	A-6	0	0	100	100	85-100	50-85	30-40	10-20
	36-60	Loam, clay loam, fine sandy loam	CL, SC	A-4, A-6	0	0	100	100	70-100	40-80	25-40	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
25:												
Farnuf----------	0-9	Loam	CL	A-6, A-4	0	0	100	100	90-95	70-80	25-35	10-15
	9-23	Loam, clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	55-85	35-45	15-20
	23-34	Loam, clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	70-95	30-45	10-20
	34-60	Clay loam, loam	CL	A-4, A-6	0	0	100	100	75-100	70-100	25-45	8-20
25B:												
Farnuf----------	0-9	Loam	CL	A-6, A-4	0	0	100	100	90-95	70-80	25-35	10-15
	9-23	Loam, clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	55-85	35-45	15-20
	23-34	Loam, clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	70-95	30-45	10-20
	34-60	Clay loam, loam	CL	A-4, A-6	0	0	100	100	75-100	70-100	25-45	8-20
25C:												
Farnuf----------	0-9	Loam	CL	A-6, A-4	0	0	100	100	90-95	70-80	25-35	10-15
	9-23	Loam, clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	55-85	35-45	15-20
	23-34	Loam, clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	70-95	30-45	10-20
	34-60	Loam, clay loam	CL	A-6, A-4	0	0	100	100	75-100	70-100	25-45	8-20
26:												
Tansem----------	0-6	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	6-14	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	14-28	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	28-60	Stratified very fine sandy loam to silt loam, silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	90-100	70-90	20-35	4-15
Roseglen--------	0-7	Loam, silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	7-24	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	24-34	Loam, silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	34-60	Loam, silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
26B:												
Tansem----------	0-6	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	6-14	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	14-28	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	28-60	Silt loam, stratified very fine sandy loam to silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	90-100	70-90	20-35	4-15
Roseglen--------	0-7	Loam, silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	7-24	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	24-34	Loam, silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	34-60	Silt loam, loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
27:												
Golva-----------	0-5	Silt loam, loam	CL	A-6	0	0	100	100	90-100	70-85	25-35	10-15
	5-15	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-45	10-20
	15-21	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-45	10-20
	21-40	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-40	10-20
	40-60	Silt loam, silty clay loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-45	10-20
27B:												
Golva-----------	0-5	Silt loam, loam	CL	A-6	0	0	100	100	90-100	70-85	25-35	10-15
	5-15	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-45	10-20
	15-21	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-45	10-20
	21-40	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-40	10-20
	40-60	Silt loam, silty clay loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
27C:												
Golva	0-5	Silt loam, loam	CL	A-6	0	0	100	100	90-100	70-85	25-35	10-15
	5-15	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-45	10-20
	15-21	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-45	10-20
	21-40	Silt loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-40	10-20
	40-60	Silt loam, silty clay loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-45	10-20
29:												
Savage	0-7	Silty clay loam, clay loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	85-95	40-50	15-25
	7-25	Silty clay, clay, silty clay loam	MH	A-7	0	0	100	100	95-100	85-95	50-65	20-30
	25-51	Silty clay, clay, silty clay loam	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
	51-80	Silty clay loam, silty clay, clay	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
29B:												
Savage	0-7	Silty clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-95	40-50	15-25
	7-25	Silty clay, clay, silty clay loam	MH	A-7	0	0	100	100	95-100	85-95	50-65	20-30
	25-51	Silty clay, clay, silty clay loam	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
	51-80	Silty clay loam, silty clay, clay	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
29C:												
Savage----------	0-7	Silty clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-95	40-50	15-25
	7-25	Silty clay, clay, silty clay loam	MH	A-7	0	0	100	100	95-100	85-95	50-65	20-30
	25-51	Silty clay, clay, silty clay loam	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
	51-60	Silty clay loam, silty clay, clay	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
30:												
Lawther----------	0-10	Silty clay, clay	CH	A-7-6	0	0	100	100	90-100	75-95	50-75	30-50
	10-33	Silty clay, clay, silty clay loam	CH	A-7-6	0	0	100	100	90-100	75-95	50-75	30-50
	33-47	Silty clay, clay, silty clay loam	CH	A-7-6	0	0	100	100	90-100	75-95	50-75	30-50
	47-60	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-95	40-65	25-40
31B:												
Cherry----------	0-3	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-20
	3-33	Silt loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-45	10-20
	33-60	Silty clay, silty clay loam, silt loam	CH, CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-60	10-30
31C:												
Cherry----------	0-3	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-20
	3-33	Silt loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-45	10-20
	33-60	Silty clay, silty clay loam, silt loam	CH, CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-60	10-30

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
32F:												
Cherry----------	0-3	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-20
	3-33	Silt loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-45	10-20
	33-60	Silty clay, silty clay loam, silt loam	CH, CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-60	10-30
Cabba----------	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
33:												
Belfield--------	0-9	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-50	15-20
	9-12	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-50	15-20
	12-17	Silty clay, silty clay loam, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-100	45-60	20-30
	17-24	Silty clay loam, silty clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-100	45-60	20-30
	24-43	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-60	15-30
	43-60	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-60	15-30

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
33:(cont.)												
Grail	0-10	Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	95-100	95-100	85-95	40-50	15-20
	10-24	Silty clay, silty clay loam, clay	CL, CH	A-7-6	0	0	100	95-100	95-100	70-95	45-55	20-30
	24-52	Silty clay loam, clay loam, silty clay	CL, CH	A-6, A-7-6	0	0	100	95-100	90-100	65-95	40-55	15-30
	52-60	Silty clay loam, loam, clay	CL, CH	A-6, A-7-6	0	0	100	95-100	85-100	60-95	30-55	10-30
33B:												
Belfield	0-9	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-50	15-20
	9-12	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-100	40-50	15-20
	12-17	Silty clay, silty clay loam, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-100	45-60	20-30
	17-24	Silty clay loam, silty clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-100	45-60	20-30
	24-43	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-60	15-30
	43-60	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-60	15-30
Savage	0-7	Silty clay loam, clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	85-95	40-50	15-25
	7-25	Silty clay, clay, silty clay loam	MH	A-7	0	0	100	100	95-100	85-95	50-65	20-30
	25-51	Silty clay, clay, silty clay loam	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
	51-80	Silty clay loam, silty clay, clay	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
34B:												
Daglum----------	0-7	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-90	20-40	10-25
	7-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	20-40	10-25
	8-18	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	90-100	70-95	35-75	15-45
	18-32	Clay loam, clay, silty clay	CH, CL	A-7, A-6	0	0	100	100	90-100	70-95	35-75	15-45
	32-47	Clay, silty clay loam, clay loam			0	0	100	100	90-100	70-95	35-75	15-40
	47-60	Clay, clay loam, silty clay loam, silty clay	CL, CH	A-6, A-7	0	0	100	100	85-100	65-95	35-60	15-40
Belfield--------	0-9	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	9-12	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-50	15-20
	12-17	Silty clay, silty clay loam, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-100	45-60	20-30
	17-24	Silty clay loam, silty clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-100	45-60	20-30
	24-43	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-60	15-30
	43-60	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-100	40-60	15-30

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
36B:												
Rhoades----------	0-3	Silt loam, loam	CL	A-6, A-7-6	0	0	100	100	85-100	60-95	30-45	10-25
	3-8	Silty clay, clay loam, clay, silty clay loam	CH	A-7-6	0	0	100	100	90-100	80-95	50-65	25-35
	8-14	Silty clay, clay, clay loam, silty clay loam	CH	A-7-6	0	0	100	100	90-100	75-95	50-65	25-35
	14-46	Silty clay, clay, silty clay loam, clay loam, loam	CH, CL, ML, MH	A-6, A-7-6	0	0	100	100	90-100	70-95	35-60	10-30
	46-60	Stratified silt loam to silty clay loam, silt loam, loam, clay loam, silty clay	CH, CL, ML	A-6, A-7-6	0	0	100	100	85-100	75-95	35-60	10-30
Daglum----------	0-7	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-90	20-40	10-25
	7-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	20-40	10-25
	8-18	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	90-100	70-95	35-75	15-45
	18-32	Clay loam, clay, silty clay	CH, CL	A-7, A-6	0	0	100	100	90-100	70-95	35-75	15-45
	32-47	Clay loam, silty clay loam, clay			0	0	100	100	90-100	70-95	35-75	15-40
	47-60	Clay, clay loam, silty clay loam, silty clay, loam	CL, CH	A-6, A-7	0	0	100	100	85-100	60-95	35-60	15-40

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
38B:												
Dogtooth--------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-8	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	8-13	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	13-21	Silty clay, silty clay loam, loam	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-60	10-30
	21-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
Janesburg-------	0-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	8-10	Silt loam, loam	CL, SC	A-2-4, A-2-6, A-4, A-6	0	0	100	100	70-100	30-90	25-40	8-15
	10-21	Silty clay, silty clay loam, clay	CL, CH	A-7-6	0	0	100	100	70-100	60-95	45-60	20-30
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CL, CH	A-6, A-7-6	0	0	100	100	70-100	60-95	30-55	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
38F:												
Dogtooth--------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-8	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	8-13	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	13-21	Silty clay, silty clay loam, loam	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-60	10-30
	21-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
38F:(cont.)												
Janesburg-------	0-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	8-10	Silt loam, loam	SC, CL	A-2-4, A-2-6, A-4, A-6	0	0	100	100	70-100	30-90	25-35	8-15
	10-21	Silty clay, silty clay loam, clay	CH, CL	A-7-6	0	0	100	100	70-100	60-95	45-60	20-30
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-55	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
Cabba-----------	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Loam, silt loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
40B:												
Desart----------	0-20	Fine sandy loam, sandy loam, very fine sandy loam	SM	A-2, A-4	0	0	100	100	60-85	30-50	0-20	NP-10
	20-24	Loamy fine sand, very fine sandy loam, fine sandy loam, sandy loam, sandy loam, loamy sand, fine sand	SM	A-2, A-4	0	0	100	100	50-70	15-50	0-20	NP-10
	24-31	Fine sandy loam, very fine sandy loam, sandy loam, loam	SC-SM	A-2, A-4	0	0	100	100	70-100	30-65	20-30	6-10
	31-60	Loamy fine sand, sandy loam, loam	SM, ML	A-4, A-2	0	0	100	100	50-100	25-65	20-30	NP-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
40B:(cont.)												
Janesburg-------	0-8	Loam, silt loam	CL	A-6, A-7-6	0	0	100	100	85-95	60-75	35-45	15-25
	8-10	Silt loam, loam	SC, CL	A-2-7, A-2-6, A-6, A-7-6	0	0	100	100	70-100	30-90	30-45	15-25
	10-21	Silty clay, silty clay loam, clay	CH, CL	A-7-6	0	0	100	100	70-100	60-95	45-60	20-30
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-55	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
Ekalaka---------	0-6	Fine sandy loam, sandy loam	CL-ML, SC	A-4, A-2	0	0	100	100	60-95	30-65	20-30	5-10
	6-12	Fine sandy loam, very fine sandy loam, loamy fine sand	SM, ML, CL-ML	A-4, A-2	0	0	100	100	65-95	30-65	15-30	NP-10
	12-17	Fine sandy loam, sandy loam, loam	ML, SM	A-4, A-2	0	0	100	100	70-100	30-70	20-35	NP-10
	17-33	Fine sandy loam, loamy fine sand, fine sand, sandy loam	SC-SM, ML, SM	A-2-4, A-4	0	0	100	100	60-85	15-55	20-30	NP-10
	33-60	Stratified fine sandy loam to loamy sand to sand	ML, SC-SM, SM	A-4, A-2-4	0	0	100	100	60-85	15-55	20-30	NP-10
41:												
Williams--------	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
41:(cont.)												
Bowbells	0-6	Loam	CL	A-6	0	0-5	95-100	90-100	85-95	60-90	25-35	10-15
	6-14	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	14-23	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	23-36	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	36-60	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
41B:												
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
Bowbells	0-6	Loam	CL	A-6	0	0-5	95-100	90-100	85-95	60-90	25-35	10-15
	6-14	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	14-23	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	23-36	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	36-60	Loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
42B:												
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
42C:												
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
43C:												
Williams--------	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
Zahl------------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
44D:												
Zahl------------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Williams--------	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
44E:												
Zahl------------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Williams--------	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
45F:												
Zahl------------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
45F:(cont.)												
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Maschetah	0-7	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	30-35	10-15
	7-48	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20
	48-90	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20
46B:												
Dooley	0-6	Fine sandy loam, sandy loam	CL, SC, SC-SM	A-4	0	0-5	90-100	80-100	65-90	35-60	20-30	4-10
	6-15	Sandy clay loam	CL, SC, SC-SM	A-7-6, A-6	0	0-5	90-100	80-100	65-95	40-70	30-45	10-20
	15-24	Sandy clay loam, sandy loam	CL, SC, SC-SM	A-6, A-4	0	0-5	90-100	80-100	65-90	35-60	25-35	8-15
	24-60	Clay loam, loam, clay	CH, CL	A-7-6, A-6, A-7	0-1	0-5	85-100	80-100	70-95	55-80	35-55	15-30
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
46C:												
Dooley	0-6	Fine sandy loam, sandy loam	CL, SC, SC-SM	A-4	0	0-5	90-100	80-100	65-90	35-60	20-30	4-10
	6-15	Sandy clay loam	CL, SC, SC-SM	A-7-6, A-6	0	0-5	90-100	80-100	65-95	40-70	30-45	10-20
	15-24	Sandy clay loam, sandy loam	CL, SC, SC-SM	A-6, A-4	0	0-5	90-100	80-100	65-90	35-60	25-35	8-15
	24-60	Clay loam, loam, clay	CH, CL	A-7-6, A-6, A-7	0-1	0-5	85-100	80-100	70-95	55-80	35-55	15-30
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
46D:												
Dooley----------	0-6	Fine sandy loam, sandy loam	CL, SC, SC-SM	A-4	0	0-5	90-100	80-100	65-90	35-60	20-30	4-10
	6-15	Sandy clay loam	CL, SC, SC-SM	A-7-6, A-6	0	0-5	90-100	80-100	65-95	40-70	30-45	10-20
	15-24	Sandy clay loam, sandy loam	CL, SC, SC-SM	A-6, A-4	0	0-5	90-100	80-100	65-90	35-60	25-35	8-15
	24-60	Clay loam, loam, clay	CH, CL	A-7-6, A-6, A-7	0-1	0-5	85-100	80-100	70-95	55-80	35-55	15-30
Zahl----------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
48:												
Temvik----------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	90-100	60-90	25-35	10-15
	7-24	Silt loam, silty clay loam, clay loam	CL	A-6	0	0	100	100	90-100	80-90	30-40	10-20
	24-44	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
	44-60	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
Wilton----------	0-8	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	8-27	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	25-35	10-15
	27-60	Clay loam, loam	CL	A-6, A-7-6	0	0-5	90-100	85-100	80-95	60-80	30-45	10-20
49:												
Temvik----------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	90-100	60-90	25-35	10-15
	7-24	Silt loam, silty clay loam, clay loam	CL	A-6	0	0	100	100	90-100	80-90	30-40	10-20
	24-44	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
	44-60	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
Williams--------	0-6	Silt loam	CL	A-6	0-2	0-5	95-100	95-100	85-95	60-80	25-35	10-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
49B:												
Temvik----------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	90-100	60-90	25-35	10-15
	7-24	Silt loam, silty clay loam, clay loam	CL	A-6	0	0	100	100	90-100	80-90	30-40	10-20
	24-44	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
	44-60	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
Williams--------	0-6	Silt loam	CL	A-6	0-2	0-5	95-100	95-100	85-95	60-80	25-35	10-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
50B:												
Temvik----------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	90-100	60-90	25-35	10-15
	7-24	Silt loam, silty clay loam, clay loam	CL	A-6	0	0	100	100	90-100	80-90	30-40	10-20
	24-44	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
	44-60	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-100	55-80	30-45	10-20
Zahl----------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
51B:												
Amor----------	0-8	Loam	CL	A-4, A-6	0	0	100	95-100	85-90	60-70	25-35	8-15
	8-19	Loam, clay loam	CL	A-6, A-4	0	0	100	95-100	90-100	65-85	30-40	10-20
	19-31	Loam, clay loam, fine sandy loam	CL	A-6, A-4	0	0	100	95-100	75-100	50-80	30-40	10-20
	31-60	Bedrock	---	---	---	---	---	---	---	---	15-45	1-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
51B:(cont.)												
Shambo	0-9	Loam, silt loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	9-13	Loam, silt loam, clay loam	CL	A-6	0	0	100	100	85-95	60-75	25-40	10-20
	13-29	Loam, silt loam, clay loam	CL	A-6	0	0	100	100	85-95	60-75	25-40	10-20
	29-48	Loam, silt loam, clay loam	CL	A-6	0	0	100	100	85-95	60-75	25-40	10-20
	48-60	Loam, silty clay loam, clay loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-75	30-45	10-20
51C:												
Amor	0-8	Loam	CL	A-4, A-6	0	0	100	95-100	85-90	60-70	25-35	8-15
	8-19	Loam, clay loam	CL	A-6	0	0	100	95-100	90-100	65-85	30-40	10-20
	19-31	Loam, clay loam, fine sandy loam	CL	A-6	0	0	100	95-100	75-100	50-80	30-40	10-20
	31-60	Bedrock	---	---	---	---	---	---	---	---	15-45	1-20
Cabba	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
51D:												
Amor	0-8	Loam	CL	A-4, A-6	0	0	100	95-100	85-90	60-70	25-35	8-15
	8-19	Loam, clay loam	CL	A-6	0	0	100	95-100	90-100	65-85	30-40	10-20
	19-31	Loam, clay loam, fine sandy loam	CL	A-6	0	0	100	95-100	75-100	50-80	30-40	10-20
	31-60	Bedrock	---	---	---	---	---	---	---	---	15-45	1-20
Cabba	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
52B:												
Reeder----------	0-8	Loam	CL	A-6	0	0	90-100	85-100	85-90	60-70	25-35	10-15
	8-17	Clay loam, loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-80	30-45	10-20
	17-36	Loam, clay loam, sandy loam	CL, SC	A-6, A-7-6	0	0-5	85-100	80-100	65-100	45-80	30-45	10-20
	36-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Farnuf----------	0-9	Loam	CL	A-6, A-4	0	0	100	100	90-95	70-80	25-35	10-15
	9-23	Loam, clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	55-85	35-45	15-20
	23-34	Loam, clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	80-95	70-95	30-45	10-20
	34-60	Clay loam, loam	CL	A-4, A-6	0	0	100	100	75-100	70-100	25-45	8-20
52C:												
Reeder----------	0-8	Loam	CL	A-6	0	0	90-100	85-100	85-90	60-70	25-35	10-15
	8-17	Clay loam, loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-80	30-45	10-20
	17-36	Loam, clay loam, sandy loam	CL, SC	A-6, A-7-6	0	0-5	85-100	80-100	65-100	45-80	30-45	10-20
	36-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Cabba----------	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
53B:												
Chama----------	0-4	Silt loam, loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-35	8-15
	4-8	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-100	30-45	10-20
	8-34	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	80-100	30-45	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
53B:(cont.)												
Sen	0-6	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	6-17	Silt loam, silty clay loam, loam	CL	A-6, A-7-6	0	0	100	100	85-100	60-95	30-45	10-20
	17-34	Silt loam, silty clay loam	CL	A-6	0	0	100	100	85-100	60-95	25-40	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	25-40	10-25
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
53C:												
Chama	0-4	Silt loam, loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-35	8-15
	4-8	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-100	30-45	10-20
	8-34	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	80-100	30-45	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Sen	0-6	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	6-17	Silt loam, silty clay loam, loam	CL	A-6, A-7-6	0	0	100	100	85-100	60-95	30-45	10-20
	17-34	Silt loam, silty clay loam	CL	A-6	0	0	100	100	85-100	60-95	25-40	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	25-40	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
53D:												
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Chama	0-4	Silt loam, loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-35	8-15
	4-8	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-100	30-45	10-20
	8-34	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	80-100	30-45	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
Sen	0-6	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	6-17	Silt loam, silty clay loam, loam	CL	A-6, A-7-6	0	0	100	100	85-100	60-95	30-45	10-20
	17-34	Silt loam, silty clay loam	CL	A-6	0	0	100	100	85-100	60-95	25-40	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	25-40	10-25
54F:												
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Sen	0-6	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	6-17	Silt loam, silty clay loam, loam	CL	A-6, A-7-6	0	0	100	100	85-100	60-95	30-45	10-20
	17-34	Silt loam, silty clay loam	CL	A-6	0	0	100	100	85-100	60-95	25-40	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	25-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
54F:(cont.)												
Chama	0-4	Silt loam, loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-35	8-15
	4-8	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-100	30-45	10-20
	8-34	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	80-100	30-45	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
55B:												
Sen	0-6	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	6-17	Silt loam, silty clay loam, loam	CL	A-6, A-7-6	0	0	100	100	85-100	60-95	30-45	10-20
	17-34	Silt loam, silty clay loam	CL	A-6	0	0	100	100	85-100	60-95	25-40	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	25-40	10-25
Janesburg	0-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	8-10	Silt loam, loam	SC, CL	A-2-6, A-2-4, A-4, A-6	0	0	100	100	70-100	30-90	25-35	8-15
	10-21	Silty clay, silty clay loam, clay	CH, CL	A-7-6	0	0	100	100	70-100	60-95	45-60	20-30
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-55	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
56B:												
Lefor	0-7	Fine sandy loam, sandy loam, loam	CL-ML, ML, SC, SM	A-4	0	0	100	100	70-85	40-55	15-30	3-10
	7-15	Fine sandy loam, loam, sandy loam	SC, CL-ML, SM	A-4	0	0	100	100	70-85	40-55	15-30	3-10
	15-30	Sandy clay loam, loam	CL-ML, SC	A-4	0	0	100	100	80-100	35-55	20-30	7-10
	30-36	Fine sandy loam, sandy loam, loam	SC, SC-SM, SM	A-4	0	0	100	100	70-85	30-55	15-30	3-10
	36-60	Bedrock	---	---	---	---	---	---	---	---	8-15	NP-3

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
56C:												
Lefor----------	0-7	Fine sandy loam, sandy loam, loam	CL-ML, ML, SC, SM	A-4	0	0	100	100	70-85	40-55	15-30	3-10
	7-15	Fine sandy loam, loam, sandy loam	SC, CL-ML, SM	A-4	0	0	100	100	70-85	40-55	15-30	3-10
	15-30	Sandy clay loam, loam	CL-ML, SC	A-4	0	0	100	100	80-100	35-55	20-30	7-10
	30-36	Fine sandy loam, sandy loam, loam	SC, SC-SM, SM	A-4	0	0	100	100	70-85	30-55	15-30	3-10
	36-60	Bedrock	---	---	---	---	---	---	---	---	8-15	NP-3
61D:												
Beisigl---------	0-5	Loamy fine sand, loamy sand	SM	A-2-4, A-4	0	0	95-100	85-100	75-95	20-40	15-20	NP-4
	5-27	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	95-100	85-100	50-100	15-35	15-20	NP-4
	27-60	Bedrock	---	---	---	---	---	---	---	---	15-20	NP-4
Flasher---------	0-6	Loamy fine sand, loamy sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	15-20	NP-4
	6-10	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	10-20	NP-4
	10-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
61F:												
Beisigl---------	0-5	Loamy fine sand, loamy sand	SM	A-2-4, A-4	0	0	95-100	85-100	75-95	20-40	15-20	NP-4
	5-27	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	95-100	85-100	50-100	15-35	15-20	NP-4
	27-60	Bedrock	---	---	---	---	---	---	---	---	15-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
61F:(cont.)												
Flasher	0-6	Loamy fine sand, loamy sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	15-20	NP-4
	6-10	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	10-20	NP-4
	10-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
Tally	0-6	Fine sandy loam, sandy loam	CL, ML, SC, SM, CL-ML	A-2, A-4	0	0	90-100	80-100	55-100	25-55	15-30	NP-10
	6-32	Fine sandy loam, sandy loam	SC, SC-SM, SM, CL-ML, ML	A-2, A-4	0	0	90-100	80-100	60-100	25-50	15-25	NP-10
	32-60	Fine sandy loam, sandy loam, loamy fine sand	SC, SC-SM, SM, CL-ML, ML	A-2, A-4	0	0	90-100	80-100	60-100	15-50	15-25	NP-10
62F:												
Flasher	0-6	Loamy fine sand, loamy sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	15-20	NP-4
	6-10	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	10-20	NP-4
	10-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
Rock outcrop	---	---	---	---	---	---	---	---	---	---	---	---
Vebar	0-5	Fine sandy loam, sandy loam	CL, SC-SM, CL-ML, SC	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	5-26	Fine sandy loam, sandy loam	CL, SC-SM, SC, CL-ML	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	26-32	Fine sandy loam, loamy fine sand, sandy loam	CL, SC-SM, SC, CL-ML	A-4, A-2-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	32-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
63B:												
Vebar----------	0-5	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	5-26	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	26-32	Fine sandy loam, loamy fine sand, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	32-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
Flasher---------	0-6	Loamy fine sand, loamy sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	15-20	NP-4
	6-10	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	10-20	NP-4
	10-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
63C:												
Vebar----------	0-5	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	5-26	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	26-32	Fine sandy loam, loamy fine sand, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	32-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
Flasher---------	0-6	Loamy fine sand, loamy sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	15-20	NP-4
	6-10	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	10-20	NP-4
	10-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
63D:												
Vebar	0-5	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	5-26	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	26-32	Fine sandy loam, loamy fine sand, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	32-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
Flasher	0-6	Loamy fine sand, loamy sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	15-20	NP-4
	6-10	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	85-100	85-100	50-100	15-35	10-20	NP-4
	10-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
Tally	0-6	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	55-100	25-55	20-30	4-10
	6-32	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	60-100	25-50	20-30	4-10
	32-60	Fine sandy loam, sandy loam, loamy fine sand	SC, SC-SM, CL, CL-ML, SM, ML	A-2-4, A-4	0	0	90-100	80-100	60-100	15-50	15-30	1-10
66B:												
Manning	0-5	Fine sandy loam	CL-ML, CL	A-4	0	0	95-100	95-100	85-95	55-70	20-30	4-10
	5-18	Fine sandy loam, loam	CL-ML, CL	A-4	0	0	90-100	80-100	80-90	50-65	20-30	4-10
	18-25	Fine sandy loam, gravelly fine sandy loam, loam	SC, SC-SM	A-4	0	0-3	55-85	50-80	30-80	25-50	20-30	4-10
	25-60	Stratified loamy sand to extremely gravelly loamy coarse sand	GM, SM, SP-SM, GC-GM	A-1-a	0	0-5	25-75	15-65	10-40	5-35	10-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
70B:												
Regent	0-10	Silty clay loam	CH, CL	A-7-6, A-6	0	0	100	100	90-100	80-100	40-55	15-25
	10-26	Silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	26-39	Silty clay loam, silty clay, clay	CL, CH	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	39-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Savage	0-7	Silty clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-95	40-50	15-25
	7-25	Silty clay, clay, silty clay loam	MH	A-7	0	0	100	100	95-100	85-95	50-65	20-30
	25-51	Silty clay, clay, silty clay loam	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
	51-60	Silty clay loam, silty clay, clay	CH, MH	A-7-6	0	0	100	100	95-100	85-95	50-60	20-30
70C:												
Regent	0-10	Silty clay loam	CH, CL	A-7-6, A-6	0	0	100	100	90-100	80-100	40-55	15-25
	10-26	Silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	26-39	Silty clay loam, silty clay, clay	CL, CH	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	39-60	Bedrock			---	---	---	---	---	---	---	---
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
71B:												
Regent	0-10	Silty clay loam	CH, CL	A-7-6, A-6	0	0	100	100	90-100	80-100	40-55	15-25
	10-26	Silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	26-39	Silty clay loam, silty clay, clay	CL, CH	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	39-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Janesburg	0-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	8-10	Silt loam, loam, fine sandy loam	CL-ML, CL	A-4, A-6	0	0	100	100	70-100	30-90	25-40	4-15
	10-21	Silty clay, silty clay loam, clay	CL, CH	A-7-6	0	0	100	100	70-100	60-95	45-60	20-30
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-55	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
71C:												
Regent	0-10	Silty clay loam	CH, CL	A-7-6, A-6	0	0	100	100	90-100	80-100	40-55	15-25
	10-26	Silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	26-39	Silty clay loam, silty clay, clay	CL, CH	A-7-6	0	0	100	100	90-100	80-100	45-60	20-30
	39-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Janesburg	0-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	8-10	Silt loam, loam, fine sandy loam	CL, CL-ML	A-4, A-6	0	0	100	100	70-100	30-90	25-40	4-15
	10-21	Silty clay, silty clay loam, clay	CL, CH	A-7-6	0	0	100	100	70-100	60-95	45-60	20-30
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CL, CH	A-6, A-7-6	0	0	100	100	70-100	60-95	30-55	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
72B:												
Moreau----------	0-6	Silty clay, clay	CH	A-7-6	0	0	100	100	90-100	70-100	55-65	30-40
	6-13	Silty clay, silty clay loam, clay	CH	A-7-6	0	0	100	100	90-100	75-100	50-75	30-50
	13-35	Silty clay, silty clay loam, clay	CH	A-7-6	0	0	100	100	90-100	75-100	50-75	30-50
	35-60	Bedrock	---	---	---	---	---	---	---	---	45-105	30-75
72C:												
Moreau----------	0-6	Silty clay, clay	CH	A-7-6	0	0	100	100	90-100	70-100	55-65	30-40
	6-13	Silty clay, silty clay loam, clay	CH	A-7-6	0	0	100	100	90-100	75-100	50-75	30-50
	13-35	Silty clay, silty clay loam, clay	CH	A-7-6	0	0	100	100	90-100	75-100	50-75	30-50
	35-60	Bedrock	---	---	---	---	---	---	---	---	45-105	30-75
Wayden----------	0-3	Silty clay, clay	CH	A-7-6	0	0	100	100	90-100	75-95	55-65	30-40
	3-15	Silty clay, clay, silty clay loam	CH	A-7-6	0	0	100	100	90-100	75-95	50-65	25-40
	15-60	Bedrock	---	---	---	---	---	---	---	---	45-100	25-75
72D:												
Moreau----------	0-6	Silty clay, clay	CH	A-7-6	0	0	100	100	90-100	70-100	55-65	30-40
	6-13	Silty clay, silty clay loam, clay	CH	A-7-6	0	0	100	100	90-100	75-100	50-75	30-50
	13-35	Silty clay, silty clay loam, clay	CH	A-7-6	0	0	100	100	90-100	75-100	50-75	30-50
	35-60	Bedrock	---	---	---	---	---	---	---	---	45-105	30-75
Cabba----------	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
80:												
Badland, high precipitation--	0-60	Bedrock	CH, CL-ML, SC, SC-SM, CL	A-4, A-6, A-7	0	0	90-100	85-100	75-100	35-95	15-75	5-50
83F:												
Cabba----------	0-3	Silt loam, loam	CL	A-4, A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Loam, silt loam, silty clay loam, clay loam	CL	A-4, A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Badland, outcrop	0-60	Unweathered bedrock	SC, CH, CL-ML, SC-SM	A-4, A-6, A-7	0	0	90-100	85-100	75-100	35-95	15-75	5-50
84F:												
Cabba----------	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Chama----------	0-4	Silt loam, loam	CL	A-6, A-4	0	0	100	100	90-100	70-90	25-35	8-15
	4-8	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-100	30-45	10-20
	8-34	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-100	30-45	10-20
	34-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
Havrelon--------	0-13	Silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	13-60	Stratified very fine sandy loam to silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	85-100	60-80	25-45	7-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
88D:												
Brandenburg-----	0-4	Channery loam	CL, CL-ML, GC-GM, SC	A-6, A-2-6, A-2-4, A-4	0	0-5	60-100	40-80	35-75	30-65	20-35	4-15
	4-10	Very channery loam, extremely channery loam, very channery sandy loam	CL, GM, ML, SM, CL-ML	A-2-6, A-4, A-6, A-2-4	0	0-5	45-100	40-80	35-75	30-65	15-35	1-15
	10-60	Channers	GW	A-1-a	0	80-85	15-25	5-10	0-5	0	15-20	NP-1
Searing---------	0-8	Loam, silt loam	CL	A-6	0	0	100	100	85-95	65-85	25-35	10-15
	8-23	Loam, clay loam, silt loam	CL	A-6	0	0	100	100	85-100	65-85	25-35	10-15
	23-33	Very channery loam, channery loam	CL, SC	A-6	0	0-5	60-100	40-80	35-75	30-65	25-35	10-15
	33-60	Channers	GP, SP	A-1-a	0	25-35	45-55	5-10	0-5	0	10-15	NP-1
Dogtooth--------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-8	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	8-13	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	13-21	Silty clay, silty clay loam, loam	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-60	10-30
	21-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
88F:												
Brandenburg-----	0-4	Channery loam	CL, CL-ML, GC-GM, SC	A-6, A-2-6, A-2-4, A-4	0	0-5	60-100	40-80	35-75	30-65	20-35	4-15
	4-10	Very channery loam, extremely channery loam, very channery sandy loam	CL, GM, ML, SM, CL-ML	A-2-6, A-4, A-6, A-2-4	0	0-5	45-100	40-80	35-75	30-65	15-35	1-15
	10-60	Channers	GW	A-1-a	0	80-85	15-25	5-10	0-5	0	15-20	NP-1

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
88F:(cont.)												
Cabba	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Dogtooth	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-8	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	8-13	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	13-21	Silty clay, silty clay loam, loam	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-60	10-30
	21-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
89F:												
Brandenburg	0-4	Very channery loam, channery loam	CL, CL-ML, GC-GM, SC	A-2-6, A-2-4, A-2, A-4, A-6	0	0-5	60-100	40-80	35-75	30-65	20-35	4-15
	4-10	Very channery loam, extremely channery loam, very channery sandy loam	CL-ML, CL, GM, ML, SM	A-2-6, A-2-4, A-2, A-4, A-6	0	0-5	60-100	40-80	35-75	30-65	15-35	1-15
	10-60	Channers	GW	A-1-a, A-1	0	80-85	15-25	5-10	0-5	0	15-20	NP-1
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Badland, outcrop	0-60	Unweathered bedrock	CH, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	0	90-100	85-100	75-100	35-95	15-75	5-50

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
90E:												
Manning---------	0-5	Fine sandy loam	CL, CL-ML	A-4	0	0	95-100	95-100	85-95	55-70	20-30	4-10
	5-18	Fine sandy loam, loam	CL, CL-ML	A-4	0	0	90-100	80-100	80-90	50-65	20-30	4-10
	18-25	Fine sandy loam, gravelly fine sandy loam, loam	SC, SC-SM	A-4	0	0-3	55-85	50-80	30-80	25-50	20-30	4-10
	25-60	Stratified loamy sand to extremely gravelly loamy coarse sand	GC-GM, GM, SM, SP-SM	A-1-a	0	0-5	25-75	15-65	10-40	5-35	10-20	NP-4
Schaller--------	0-9	Sandy loam, fine sandy loam	CL-ML, SC-SM, SM, ML	A-2-4, A-4	0	0	95-100	95-100	55-85	25-55	10-25	NP-7
	9-15	Fine sandy loam, loamy fine sand, gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1-b, A-2-4, A-3, A-4	0	0-5	55-100	50-100	40-85	5-55	0-20	NP-5
	15-60	Gravelly loamy coarse sand, gravelly sand, sand	GM, GC-GM, SM, SP-SM	A-1-b, A-2-4, A-3	0	0-5	55-90	50-90	40-70	5-15	0-20	NP-5
Wabek-----------	0-5	Loam	CL	A-6, A-4	0	0-1	90-100	90-100	75-90	50-70	25-35	8-15
	5-9	Gravelly sandy loam, gravelly loam, gravelly coarse sandy loam	SC-SM, SC, GC-GM, GC	A-1-b, A-2-4, A-4, A-6, A-2-6	0	0-1	50-80	50-80	30-60	20-40	20-35	4-15
	9-60	Very gravelly sand, extremely gravelly loamy coarse sand, very gravelly loamy sand, very gravelly coarse sand	SP-SM, SM, SP, SW, SC-SM, SW-SM, GC-GM, GM, GW-GM, GP-GM, GW, GP	A-1-b, A-1-a, A-2-4	0	0-1	25-90	10-65	5-35	0-25	15-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
91F:												
Wabek	0-5	Gravelly loam, loam	CL	A-4, A-6	0	0-1	80-100	80-100	75-95	55-75	25-35	8-15
	5-9	Gravelly coarse sandy loam, gravelly loam, gravelly sandy loam	SC-SM, SC, GC-GM, GC	A-1-b, A-2-4, A-4, A-6, A-2-6	0	0-1	50-80	50-80	30-60	20-40	20-35	4-15
	9-60	Extremely gravelly loamy coarse sand, very gravelly sand, very gravelly loamy sand, very gravelly coarse sand	SP-SM, SM, SP, SW, SC-SM, SW-SM, GC-GM, GM, GW-GM, GP-GM, GW, GP	A-1-b, A-1-a, A-2-4	0	0-1	25-90	10-65	5-35	0-25	15-20	NP-4
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
93B:												
Lehr	0-6	Loam	CL	A-6	0	0	95-100	95-100	85-95	60-80	25-35	10-15
	6-11	Loam, clay loam, gravelly loam	CL	A-6	0-2	0-5	90-100	80-100	75-95	40-75	25-35	10-20
	11-15	Loam, gravelly loam	CL	A-6	0-2	0-5	90-100	80-100	75-95	40-75	25-35	10-15
	15-22	Gravelly loamy coarse sand, gravelly coarse sandy loam, very gravelly coarse sandy loam, very gravelly loamy coarse sand	SM, SC-SM	A-2-4	0-2	0-5	65-90	50-75	30-50	5-15	15-30	1-10
	22-60	Very gravelly coarse sand, gravelly loamy sand, gravelly sand	GM, GC-GM	A-1-a	0-2	0-5	40-80	25-60	10-35	2-15	10-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
93B:(cont.)												
Stady	0-6	Loam	CL	A-6	0	0-1	95-100	95-100	85-95	60-75	25-35	10-15
	6-15	Loam	CL	A-6	0	0-1	95-100	95-100	85-95	60-75	25-35	10-15
	15-29	Loam, gravelly loam	CL	A-6	0	0-1	80-100	80-100	75-95	55-75	25-35	10-15
	29-60	Very gravelly coarse sand, extremely gravelly coarse sand, very gravelly loamy sand, extremely gravelly loamy sand, very gravelly sand, extremely gravelly sand	GM, SM, SP, SC-SM, GC-GM	A-1-b	0	0-1	40-80	25-60	10-30	2-15	10-20	NP-4
94B:												
Searing	0-8	Loam, silt loam	CL	A-6	0	0	100	100	85-95	65-85	25-35	10-15
	8-23	Loam, clay loam, silt loam	CL	A-6	0	0	100	100	85-100	65-85	25-35	10-15
	23-33	Very channery loam, channery loam	CL, SC	A-6	0	0-5	60-100	40-80	35-75	30-65	25-35	10-15
	33-60	Channers	GP, SP	A-1-a	0	25-35	45-55	5-10	0-5	0	10-15	NP-1
Ringling	0-5	Loam	CL	A-6	0	0-10	90-100	75-100	75-90	50-65	25-35	10-15
	5-17	Very channery loam, extremely channery loam	SC-SM, GC, GC-GM, SC	A-2-6	0	10-40	25-60	15-50	15-40	10-35	25-35	10-15
	17-42	Channers	GW	A-1-a	0	80-85	15-25	5-10	0-5	0-5	10-15	NP-1
	42-60	Channers	GW	A-1-a	0	80-85	15-25	5-10	0-5	0-5	10-15	NP-1
95:												
Havrelon	0-13	Silty clay	CH, CL	A-7	0	0	100	100	95-100	80-95	45-70	25-50
	13-60	Stratified very fine sandy loam to silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	85-100	60-80	25-45	7-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
96:												
Pits, gravel and sand----------	0-6	Extremely gravelly sand	GW-GM, SW-SM, GM, SW	A-2-4	0	0-5	25-90	10-65	5-55	0-25	10-20	NP-4
	6-60	Extremely gravelly sand, extremely gravelly coarse sand, gravelly coarse sandy loam	GW-GM, SW-SM, SM, GM	A-2-4	0	0-10	25-90	10-65	5-55	0-25	15-25	NP-8
98F:												
Tinsley---------	0-3	Gravelly sandy loam, gravelly loamy sand, very gravelly sandy loam, very gravelly loamy sand	SM, SC-SM, SC	A-1-b, A-2-4, A-4	0	0-10	60-85	55-85	35-55	15-40	15-30	1-8
	3-60	Extremely gravelly loamy sand, very gravelly sand, extremely gravelly sand, very gravelly loamy sand	GM, GP-GM, SM, SP-SM, SC-SM, GC-GM, SW-SM, GW-GM	A-1-b, A-1-a	0-5	10-35	25-80	20-70	10-35	5-15	15-25	NP-4
Chanta----------	0-6	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	6-22	Loam, clay loam	CL	A-6	0	0	80-100	75-100	65-90	65-85	30-40	10-20
	22-26	Sandy loam	CL-ML, SC, SC-SM, CL	A-2, A-4	0	0	80-100	75-100	65-90	30-65	20-30	4-10
	26-60	Gravelly sand	SM, SP-SM, SW-SM	A-1, A-3, A-2-4	0	5-20	60-80	40-65	15-55	5-15	15-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
99:												
Mckeen----------	0-2	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	2-12	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	12-15	Loam, silt loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6, A-5	0	0	100	100	90-100	70-100	30-60	10-35
	15-60	Stratified loamy fine sand to silty clay	CH, CL, ML	A-7-6, A-6, A-4	0	0	100	100	60-100	25-100	15-60	1-30
100F:												
Boxwell---------	0-5	Loam, silt loam	CL	A-6	0	0	100	95-100	90-100	70-90	25-35	10-15
	5-14	Loam, clay loam, silty clay loam	CL	A-6	0	0	100	95-100	90-95	70-85	30-40	10-20
	14-28	Loam, silt loam, very fine sandy loam	CL	A-6	0	0	100	95-100	85-95	70-80	25-35	10-15
	28-60	Bedrock			---	---	---	---	---	---	15-45	1-20
Cabbart---------	0-3	Loam, silt loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
100F:(cont.)												
Arikara	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
101F:												
Cabbart	0-3	Loam, silt loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock			---	---	---	---	---	---	20-45	4-20
Badland, outcrop	0-60	Bedrock	---	---	0	0	90-100	85-100	75-100	35-95	15-75	5-50
102B:												
Kremlin	0-11	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	11-19	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
	19-60	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
102B:(cont.)												
Ethridge--------	0-3	Silt loam, loam	CL	A-6	0	0	100	95-100	70-100	60-80	30-40	10-15
	3-10	Silty clay loam, silty clay, clay	CH	A-7	0	0	100	95-100	95-100	90-95	45-65	20-30
	10-23	Silty clay loam, clay loam, clay	CH	A-7	0	0	100	95-100	95-100	90-95	45-65	20-30
	23-38	Silty clay loam, clay loam, clay	CL, CH	A-7-6	0	0	100	95-100	90-100	85-95	40-60	15-30
	38-60	Silt loam, clay loam, silty clay loam	ML	A-6, A-7-6	0	0	100	95-100	90-100	85-95	35-50	10-20
Gerda-----------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-95	30-40	10-15
	2-11	Silty clay, silty clay loam, clay, clay loam	MH	A-7	0	0	100	100	90-100	80-95	50-70	20-35
	11-19	Clay loam, silty clay, silty clay loam, clay	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	19-29	Silty clay loam, silty clay, clay loam	CL, CH	A-7-6	0	0	100	100	90-100	70-95	40-60	20-30
	29-44	Clay loam, silty clay loam, silty clay	MH	A-7	0	0	100	100	90-100	70-95	50-65	20-30
	44-80	Silt loam, loam, sandy loam	CL	A-6, A-4	0	0	100	100	60-90	30-90	30-40	8-15

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
103B:												
Chinook	0-6	Fine sandy loam, sandy loam	CL-ML, SC-SM	A-4, A-2-4	0	0	100	100	85-95	30-55	20-30	4-10
	6-15	Fine sandy loam, sandy loam	SC-SM	A-4, A-2-4	0	0	100	100	85-95	30-45	20-30	4-10
	15-40	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-4, A-2-4	0	0	100	100	60-95	30-60	20-30	4-10
	40-66	Fine sandy loam, sandy loam, loamy fine sand	SC-SM, SM	A-2-4, A-4	0	0	100	100	70-95	25-40	15-30	1-10
Rhame	0-8	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-4	0	0	100	100	70-85	40-55	20-30	4-10
	8-26	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-4	0	0	100	100	70-85	40-55	20-30	4-10
	26-34	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-4	0	0	100	100	70-85	40-55	20-30	4-10
	34-60	Bedrock	---	---	---	---	---	---	---	---	5-20	NP-5
103D:												
Rhame	0-8	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	8-26	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	26-34	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	34-60	Bedrock	---	---	---	---	---	---	---	---	5-20	NP-5

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
103D:(cont.)												
Chinook	0-6	Fine sandy loam, sandy loam	CL-ML, SC-SM	A-4, A-2-4	0	0	100	100	85-95	30-55	20-30	4-10
	6-15	Fine sandy loam, sandy loam	SC-SM	A-4, A-2-4	0	0	100	100	85-95	30-45	20-30	4-10
	15-40	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-4, A-2-4	0	0	100	100	60-95	30-60	20-30	4-10
	40-66	Fine sandy loam, sandy loam, loamy fine sand	SC-SM, SM	A-2-4, A-4	0	0	100	100	70-95	25-40	15-30	1-10
103F:												
Rhame	0-8	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	8-26	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	26-34	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	34-60	Bedrock	---	---	---	---	---	---	---	---	5-20	NP-5
Fleak	0-3	Loamy fine sand	SC-SM, SM	A-1, A-4, A-2	0	0	95-100	95-100	45-80	20-40	15-20	NP-4
	3-17	Loamy fine sand, fine sand	SM	A-1, A-2, A-4	0	0	95-100	95-100	40-85	20-40	15-20	NP-4
	17-60	Bedrock	---	---	---	---	---	---	---	---	15-20	NP-4
104E:												
Badland, outcrop	0-60	Bedrock	---	---	0	0	90-100	85-100	75-100	35-95	15-75	5-50
Patent	0-7	Loam, silt loam	CL	A-6	0	0	100	100	70-100	50-85	25-35	10-15
	7-60	Stratified fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	70-100	50-90	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
105:												
Havre	0-10	Silt loam, loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	10-60	Stratified fine sandy loam to clay loam	CL	A-6, A-7-6	0	0	100	100	70-95	50-75	30-45	10-20
106:												
Glendive	0-5	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0	100	100	65-85	30-55	20-30	4-10
	5-16	Loam, silt loam, sandy loam	CL, SC-SM, SC, SM, CL-ML, ML	A-4	0	0	100	100	65-95	40-70	20-30	3-10
	16-60	Fine sandy loam, stratified loamy fine sand to silt loam	CL-ML, ML, SC, SM, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-80	25-50	15-30	1-10
107:												
Kremlin	0-11	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	11-19	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
	19-60	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
108B:												
Hanly	0-5	Fine sandy loam, sandy loam	SC-SM, CL, CL-ML, SC	A-4, A-2-4	0	0	100	100	70-85	30-55	20-30	4-10
	5-60	Stratified loamy sand to fine sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	100	100	50-85	5-40	15-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
109:												
Havre, wooded---	0-10	Silt loam, loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	10-60	Stratified fine sandy loam to clay loam	CL	A-6, A-7-6	0	0	100	100	70-95	50-75	30-45	10-20
110B:												
Maltese---------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	7-10	Silt loam	CL	A-6	0	0	100	100	90-100	60-90	30-40	10-15
	10-16	Silty clay, clay	CH	A-7	0	0	100	100	90-100	85-95	50-75	25-40
	16-20	Silty clay, silty clay loam, clay, clay loam	MH	A-7	0	0	100	100	90-100	70-90	50-65	20-30
	20-33	Silty clay loam, clay, clay loam, silty clay	MH	A-7	0	0	100	100	70-95	55-95	50-65	20-30
	33-60	Silty clay loam, fine sandy loam, loam, silt loam	CL, SC	A-6, A-4	0	0	100	100	70-100	45-95	30-55	8-25
Gerda-----------	0-2	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-95	30-40	10-15
	2-11	Clay loam, silty clay loam, silty clay, clay	MH	A-7	0	0	100	100	90-100	80-95	50-70	20-35
	11-19	Silty clay, clay loam, silty clay loam, clay	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	19-29	Clay loam, silty clay, silty clay loam	CL, CH	A-7-6	0	0	100	100	90-100	70-95	40-60	20-30
	29-44	Clay loam, silty clay loam, silty clay	MH	A-7	0	0	100	100	90-100	70-95	50-65	20-30
	44-80	Sandy loam, loam, silt loam	CL	A-6, A-4	0	0	100	100	60-90	30-90	30-40	8-15

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
111D:												
Gerda----------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-95	30-40	10-15
	2-11	Clay loam, clay, silty clay, silty clay loam	MH	A-7	0	0	100	100	90-100	80-95	50-70	20-35
	11-19	Clay loam, silty clay, silty clay loam, clay	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	19-29	Silty clay loam, silty clay, clay loam	CL, CH	A-7-6	0	0	100	100	90-100	70-95	40-60	20-30
	29-44	Silty clay, clay loam, silty clay loam	MH	A-7	0	0	100	100	90-100	70-95	50-65	20-30
	44-80	Silt loam, loam, sandy loam	CL	A-6, A-4	0	0	100	100	60-90	30-90	30-40	8-15
Kirby----------	0-4	Very channery loam, channery loam	CL-ML, SC-SM, CL, SC, GC-GM, GC	A-4, A-2-4	0	0-15	40-85	30-75	25-65	20-60	10-20	4-10
	4-12	Extremely channery loam, extremely channery sandy loam, very channery loam	GC-GM, GC	A-4, A-1, A-2-4	0	10-30	20-60	10-50	5-40	5-40	10-20	4-10
	12-60	Channers	GW	A-1-a	0	40-60	5-15	0-10	0-5	0-5	15-20	NP-1
111F:												
Kirby----------	0-4	Very channery loam, channery loam	CL-ML, SC-SM, CL	A-4, A-2-4	0	0-15	40-85	30-75	25-65	20-60	10-20	4-10
	4-12	Extremely channery loam, extremely channery sandy loam, very channery loam	GC-GM, GC	A-4, A-1, A-2-4	0	10-30	20-60	10-50	5-40	5-40	10-20	4-10
	12-60	Channers	GW	A-1-a	0	40-60	5-15	0-10	0-5	0-5	15-20	NP-1

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
111F:(cont.)												
Scairt----------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-6	Silty clay, clay, clay loam, silty clay loam	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	6-13	Silty clay loam, silty clay, clay loam, clay	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	13-22	Silty clay loam, silty clay, silt loam	CH, CL, MH, ML	A-6, A-7	0	0	100	100	90-100	70-95	30-65	10-30
	22-28	Silty clay loam, silty clay, silt loam	CH, CL, MH, ML	A-7, A-6	0	0	100	100	90-100	70-95	30-65	10-30
	28-60	Bedrock	---	---	0	0	100	100	---	---	25-80	10-50
112F:												
Kirby----------	0-4	Very channery loam, channery loam	CL-ML, SC-SM, CL	A-4, A-2-4	0	0-15	40-85	30-75	25-65	20-60	10-20	4-10
	4-12	Extremely channery loam, extremely channery sandy loam, very channery loam	GC-GM, GC	A-4, A-1, A-2-4	0	10-30	20-60	10-50	5-40	5-40	10-20	4-10
	12-60	Channers	GW	A-1-a	0	40-60	5-15	0-10	0-5	0-5	15-20	NP-1
Badland, outcrop	0-60	Bedrock	---	---	0	0	90-100	85-100	75-100	35-95	15-75	5-50
Patent----------	0-7	Loam, silt loam	CL	A-6	0	0	100	100	70-100	50-85	25-35	10-15
	7-60	Stratified fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	70-100	50-90	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
113F:												
Lonna	0-2	Silt loam, loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	2-11	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	75-95	30-45	10-20
	11-34	Silt loam, silty clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	95-100	75-95	30-45	10-20
	34-60	Silt loam, silty clay loam, very fine sandy loam	CL, CL-ML	A-6, A-4, A-7-6, A-5	0	0	100	100	95-100	75-90	20-45	4-20
Cabbart	0-3	Silt loam, loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
114:												
Channel	---	---	---	---	---	---	---	---	---	---	---	---
Glendive	0-5	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0	100	100	65-85	30-55	20-30	4-10
	5-16	Loam, silt loam, sandy loam	CL, SC-SM, SC, SM, CL-ML, ML	A-4	0	0	100	100	65-95	40-70	20-30	3-10
	16-60	Fine sandy loam, stratified loamy fine sand to silt loam	SC, SM, SC-SM, CL-ML, ML	A-2-4, A-4	0	0	95-100	90-100	60-80	25-50	15-30	1-10
Havre	0-10	Silt loam, loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	10-60	Stratified fine sandy loam to clay loam	CL	A-6, A-7-6	0	0	100	100	70-95	50-75	30-45	10-20
115F:												
Badland, outcrop	0-60	Bedrock	---	---	0	0	90-100	85-100	75-100	35-95	15-75	5-50

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
115F:(cont.)												
Arikara---------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	SC, SC-SM, CL	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
Cabbart---------	0-3	Loam, silt loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
116F:												
Kremlin---------	0-11	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	11-19	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
	19-60	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
Cabbart---------	0-3	Loam, silt loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
117:												
Wolf Point------	0-1	Silty clay loam	CL	A-7-6	0	0	100	100	90-100	75-95	45-55	20-35
	1-10	Silty clay loam, silty clay, clay	CH, CL	A-7-6	0	0	100	100	90-100	75-95	45-75	25-50
	10-60	Silty clay, silty clay loam, clay	CH, CL	A-7-6	0	0	100	100	90-100	75-95	45-75	25-50
118F:												
Lonna----------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	2-11	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	75-95	30-45	10-20
	11-34	Silt loam, silty clay loam	CL	A-6, A-5, A-7-6	0	0	100	100	95-100	75-95	30-45	10-20
	34-60	Silt loam, silty clay loam, very fine sandy loam	CL, CL-ML	A-6, A-4, A-7-6, A-5	0	0	100	100	95-100	75-90	20-45	4-20
Kirby----------	0-4	Very channery loam, channery loam	CL-ML, SC-SM, CL	A-4, A-2-4	0	0-15	40-85	30-75	25-65	20-60	10-20	4-10
	4-12	Extremely channery loam, extremely channery sandy loam, very channery loam	GC-GM, GC	A-4, A-1, A-2-4	0	10-30	20-60	10-50	5-40	5-40	10-20	4-10
	12-60	Channers	GW	A-1-a	0	40-60	5-15	0-10	0-5	0-5	15-20	NP-1
Cabbart---------	0-3	Silt loam, loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
119F:												
Patent----------	0-7	Loam, silt loam	CL	A-6	0	0	100	100	70-100	50-85	25-35	10-15
	7-60	Stratified fine sandy loam to clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	70-100	50-90	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
119F:(cont.)												
Badland, outcrop	0-60	Bedrock			0	0	90-100	85-100	75-100	35-95	15-75	5-50
Cabbart---------	0-3	Loam, silt loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
121F:												
Maltese---------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	7-10	Silt loam	CL	A-6	0	0	100	100	90-100	60-90	30-40	10-15
	10-16	Silty clay, clay	CH	A-7	0	0	100	100	90-100	85-95	50-75	25-40
	16-20	Silty clay, silty clay loam, clay, clay loam	MH	A-7	0	0	100	100	90-100	70-90	50-65	20-30
	20-33	Silty clay loam, clay, clay loam, silty clay	MH	A-7	0	0	100	100	70-95	55-95	50-65	20-30
	33-60	Silty clay loam, fine sandy loam, loam, silt loam	CL, SC	A-6, A-4	0	0	100	100	70-100	45-95	30-55	8-25
Lonna-----------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	2-11	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	75-95	30-45	10-20
	11-34	Silt loam, silty clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	95-100	75-95	30-45	10-20
	34-60	Silt loam, silty clay loam, very fine sandy loam	CL, CL-ML	A-6, A-4, A-5, A-7-6	0	0	100	100	95-100	75-90	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
121F:(cont.)												
Arikara	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
127:												
Maschetah	0-7	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	30-35	10-15
	7-48	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20
	48-80	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20
127B:												
Maschetah	0-7	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	30-35	10-15
	7-48	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20
	48-80	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20
127C:												
Maschetah	0-7	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	30-35	10-15
	7-48	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20
	48-80	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	95-100	95-100	95-100	90-100	30-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
131B:												
Lonna	0-2	Silt loam, loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	2-11	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	75-95	30-45	10-20
	11-34	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	75-95	30-45	10-20
	34-60	Silt loam, silty clay loam, very fine sandy loam	CL, CL-ML	A-6, A-4, A-7-6, A-5	0	0	100	100	95-100	75-90	20-45	4-20
131C:												
Lonna	0-2	Silt loam, loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	2-11	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	75-95	30-45	10-20
	11-34	Silt loam, silty clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	95-100	75-95	30-45	10-20
	34-60	Silt loam, silty clay loam, very fine sandy loam	CL, CL-ML	A-6, A-4, A-7-6, A-5	0	0	100	100	95-100	75-90	20-45	4-20
132C:												
Patent	0-7	Loam, silt loam	CL	A-6	0	0	100	100	70-100	50-85	25-35	10-15
	7-60	Stratified fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	70-100	50-90	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
132C:(cont.)												
Gerda	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-95	30-40	10-15
	2-11	Silty clay loam, silty clay, clay loam, clay	MH	A-7	0	0	100	100	90-100	80-95	50-70	20-35
	11-19	Silty clay, clay, silty clay loam, clay loam	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	19-29	Silty clay, silty clay loam, clay loam	CL, CH	A-7-6	0	0	100	100	90-100	70-95	40-60	20-30
	29-44	Silty clay, silty clay loam, clay loam	MH	A-7	0	0	100	100	90-100	70-95	50-65	20-30
	44-80	Sandy loam, loam, silt loam	CL	A-6, A-4	0	0	100	100	60-90	30-90	30-40	8-15
Slickspots	0-1	Silty clay	CH	A-7	0	0	100	100	90-100	80-100	50-75	25-40
	1-60	Stratified loam to silty clay	CH	A-7	0	0	100	100	90-100	60-100	30-65	10-30
138E:												
Scairt	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-6	Silty clay, clay, clay loam, silty clay loam	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	6-13	Silty clay loam, silty clay, clay loam, clay	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	13-22	Silty clay loam, silty clay, silt loam	CH, CL, MH, ML	A-6, A-7	0	0	100	100	90-100	70-95	30-65	10-30
	22-28	Silty clay loam, silty clay, silt loam	CH, CL, MH, ML	A-7, A-6	0	0	100	100	90-100	70-95	30-65	10-30
	28-60	Bedrock	---	---	0	0	100	100	---	---	25-80	10-50

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
138E:(cont.)												
Maltese---------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	7-10	Silt loam	CL	A-6	0	0	100	100	90-100	60-90	30-40	10-15
	10-16	Silty clay, clay	CH	A-7	0	0	100	100	90-100	85-95	50-75	25-40
	16-20	Silty clay, silty clay loam, clay, clay loam	MH	A-7	0	0	100	100	90-100	70-90	50-65	20-30
	20-33	Silty clay loam, clay, clay loam, silty clay	MH	A-7	0	0	100	100	70-95	55-95	50-65	20-30
	33-60	Silty clay loam, fine sandy loam, loam, silt loam	CL, SC	A-6, A-4	0	0	100	100	70-100	45-95	30-55	8-25
Boxwell---------	0-5	Loam, silt loam	CL	A-6	0	0	100	95-100	90-100	70-90	25-35	10-15
	5-14	Loam, clay loam, silty clay loam	CL	A-6	0	0	100	95-100	90-95	70-85	30-40	10-20
	14-28	Loam, silt loam, very fine sandy loam	CL	A-6	0	0	100	95-100	85-95	70-80	25-35	10-15
	28-60	Bedrock	---	---	---	---	---	---	---	---	15-45	1-20
145F:												
Zahl------------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Cabba-----------	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
145F:(cont.)												
Arikara	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
146B:												
Dooley	0-6	Fine sandy loam, sandy loam	CL, SC, SC-SM	A-4	0	0-5	90-100	80-100	65-90	35-60	20-30	4-10
	6-15	Sandy clay loam	CL, SC, SC-SM	A-7-6, A-6	0	0-5	90-100	80-100	65-95	40-70	30-45	10-20
	15-24	Sandy clay loam, sandy loam	CL, SC, SC-SM	A-6, A-4	0	0-5	90-100	80-100	65-90	35-60	25-35	8-15
	24-60	Clay loam, loam, clay	CH, CL	A-7-6, A-6, A-7	0-1	0-5	85-100	80-100	70-95	55-80	35-55	15-30
151B:												
Boxwell	0-5	Loam, silt loam	CL	A-6	0	0	100	95-100	90-100	70-90	25-35	10-15
	5-14	Loam, clay loam, silty clay loam	CL	A-6	0	0	100	95-100	90-95	70-85	30-40	10-20
	14-28	Loam, silt loam, very fine sandy loam	CL	A-6	0	0	100	95-100	85-95	70-80	25-35	10-15
	28-60	Bedrock	---	---	---	---	---	---	---	---	15-45	1-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
151B:(cont.)												
Kremlin---------	0-11	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	11-19	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
	19-60	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
151D:												
Boxwell---------	0-5	Loam, silt loam	CL	A-6	0	0	100	95-100	90-100	70-90	25-35	10-15
	5-14	Loam, clay loam, silty clay loam	CL	A-6	0	0	100	95-100	90-95	70-85	30-40	10-20
	14-28	Loam, silt loam, very fine sandy loam	CL	A-6	0	0	100	95-100	85-95	70-80	25-35	10-15
	28-60	Bedrock	---	---	---	---	---	---	---	---	15-45	1-20
Kremlin---------	0-11	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	11-19	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
	19-60	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
154F:												
Arikara---------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
154F:(cont.)												
Shambo----------	0-9	Loam, silt loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	9-13	Loam, silt loam, clay loam	CL	A-6	0	0	100	100	85-95	60-75	25-40	10-20
	13-29	Loam, silt loam, clay loam	CL	A-6	0	0	100	100	85-95	60-75	25-40	10-20
	29-48	Loam, silt loam, clay loam	CL	A-6	0	0	100	100	85-95	60-75	25-40	10-20
	48-60	Loam, silty clay loam, clay loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-75	30-45	10-20
Cabba----------	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
161F:												
Beisigl---------	0-5	Loamy fine sand, loamy sand	SC-SM, SM	A-2, A-4	0	0	95-100	85-100	75-95	20-40	0-20	NP-5
	5-27	Loamy fine sand, loamy sand, fine sand	SM	A-2	0	0	95-100	85-100	50-100	15-35	0-14	NP
	27-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Flasher---------	0-6	Loamy fine sand, loamy sand	SM	A-2	0	0	85-100	85-100	50-100	15-35	10-20	NP
	6-10	Loamy fine sand, loamy sand, fine sand	SM	A-2	0	0	85-100	85-100	50-100	15-35	10-20	NP
	10-60	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
161F:(cont.)												
Arikara	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-4	0	0	100	100	85-100	70-80	25-35	10-15
	2-14	Loam, clay loam, silt loam, silty clay loam	CL-ML, CL	A-7, A-6	0	0	85-100	80-100	70-100	40-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, SC, CL-ML, CL	A-6, A-4	0	0	85-100	80-100	70-100	50-90	25-45	5-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	SC-SM, CL, CL-ML, SC	A-4, A-6	0	0	85-100	80-100	70-100	40-90	25-35	5-25
164D:												
Vebar, extremely stony	0-5	Extremely stony fine sandy loam, extremely stony sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	3-15	2-14	95-100	90-100	60-100	30-55	20-30	4-10
	5-26	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	26-32	Fine sandy loam, loamy fine sand, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	32-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
171:												
Lohler, moderately saline	0-8	Silty clay	CH	A-7-6, A-7	0	0	100	100	95-100	80-95	55-75	30-50
	8-60	Stratified silty clay, stratified silty clay loam to clay	CH	A-7-6, A-7	0	0	100	100	95-100	80-95	50-75	30-50

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
180:												
Badland---	0-60	Bedrock	---	---	0	0	90-100	85-100	75-100	35-95	15-75	5-50
183F:												
Badland, outcrop	0-60	Bedrock	CL, CH, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	0	90-100	85-100	75-100	35-95	15-75	5-50
Cabba---	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Loam, silt loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
187F:												
Arikara---	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
Cabbart---	0-3	Loam, silt loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
193B:												
Chanta----------	0-6	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	6-22	Loam, clay loam	CL	A-6	0	0	80-100	75-100	65-90	65-85	30-40	10-20
	22-26	Sandy loam	CL-ML, SC, SC-SM, CL	A-2, A-4	0	0	80-100	75-100	65-90	30-65	20-30	4-10
	26-60	Gravelly sand	SM, SP-SM, SW-SM	A-1, A-3, A-2-4	0	5-20	60-80	40-65	15-55	5-15	15-20	NP-4
194F:												
Kirby----------	0-4	Very channery loam, channery loam	CL-ML, SC-SM, CL	A-4, A-2-4	0	0-15	40-85	30-75	25-65	20-60	10-20	4-10
	4-12	Extremely channery loam, extremely channery sandy loam, very channery loam	GC-GM, GC	A-4, A-1, A-2-4	0	10-30	20-60	10-50	5-40	5-40	10-20	4-10
	12-60	Channers	GW	A-1-a	0	40-60	5-15	0-10	0-5	0-5	15-20	NP-1
Arikara----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
Badland, outcrop	0-60	Unweathered bedrock	---	---	0	0	90-100	85-100	75-100	35-95	15-75	5-50

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
195:												
Havrelon	0-13	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	85-100	60-95	35-45	15-20
	13-60	Stratified very fine sandy loam to silty clay loam	CL	A-7-6, A-4, A-6	0	0	100	100	85-100	60-80	25-45	8-20
199:												
Mckeen	0-2	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	2-12	Loam, silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	12-15	Loam, silt loam, silty clay loam, silty clay	CL, CH	A-6, A-7-6	0	0	100	100	90-100	70-100	30-60	10-35
	15-60	Stratified loamy fine sand to silty clay	CL, ML, CH	A-6, A-4	0	0	100	100	60-100	25-100	15-60	1-30
201F:												
Badland, outcrop	0-60	Bedrock	---	---	0	0	90-100	85-100	75-100	35-95	15-75	5-50
Cabbart	0-3	Loam, silt loam	CL	A-6	0	0	90-100	85-100	75-95	55-80	25-35	10-15
	3-18	Loam, silt loam, clay loam, silty clay loam	CL	A-6	0	0	90-100	85-100	75-95	60-85	30-45	10-20
	18-60	Bedrock	---	---	---	---	---	---	---	---	20-45	4-20
202D:												
Boxwell	0-5	Loam, silt loam	CL	A-6	0	0	100	95-100	90-100	70-90	25-35	10-15
	5-14	Loam, clay loam, silty clay loam	CL	A-6	0	0	100	95-100	90-95	70-85	30-40	10-20
	14-28	Loam, silt loam, very fine sandy loam	CL	A-6	0	0	100	95-100	85-95	70-80	25-35	10-15
	28-60	Bedrock	---	---	---	---	---	---	---	---	15-45	1-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
202D:(cont.)												
Scairt----------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-6	Silty clay, clay, clay loam, silty clay loam	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	6-13	Silty clay loam, silty clay, clay loam, clay	MH	A-7	0	0	100	100	90-100	70-95	50-70	20-35
	13-22	Silty clay loam, silty clay, silt loam	CH, CL, MH, ML	A-7, A-6	0	0	100	100	90-100	70-95	30-65	10-30
	22-28	Silty clay loam, silty clay, silt loam	CH, CL, ML, MH	A-7, A-6	0	0	100	100	90-100	70-95	30-65	10-30
	28-60	Bedrock	---	---	0	0	100	100	---	---	25-80	10-50
Maltese----------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	7-10	Silt loam	CL	A-6	0	0	100	100	90-100	60-90	30-40	10-15
	10-16	Silty clay, clay	CH	A-7	0	0	100	100	90-100	85-95	50-75	25-40
	16-20	Silty clay, silty clay loam, clay, clay loam	MH	A-7	0	0	100	100	90-100	70-90	50-65	20-30
	20-33	Silty clay loam, clay, clay loam, silty clay	MH	A-7	0	0	100	100	70-95	55-95	50-65	20-30
	33-60	Silty clay loam, fine sandy loam, loam, silt loam	CL, SC	A-6, A-4	0	0	100	100	70-100	45-95	30-55	8-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
203D:												
Rhame----------	0-8	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	8-26	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	26-34	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	34-60	Bedrock	---	---	---	---	---	---	---	---	5-20	NP-5
Kremlin----------	0-11	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	11-19	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
	19-60	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	30-40	10-20
Maltese----------	0-7	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	7-10	Silt loam	CL	A-6	0	0	100	100	90-100	60-90	30-40	10-15
	10-16	Silty clay, clay	CH	A-7	0	0	100	100	90-100	85-95	50-75	25-40
	16-20	Silty clay, silty clay loam, clay, clay loam	MH	A-7	0	0	100	100	90-100	70-90	50-65	20-30
	20-33	Silty clay loam, clay, clay loam, silty clay	MH	A-7	0	0	100	100	70-95	55-95	50-65	20-30
	33-60	Silty clay loam, fine sandy loam, loam, silt loam	CL, SC	A-6, A-4	0	0	100	100	70-100	45-95	30-55	8-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
203F:												
Rhame----------	0-8	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	8-26	Fine sandy loam, sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	26-34	Fine sandy loam, sandy loam	ML, SC-SM, SM, CL-ML	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	34-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Scairt----------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-15
	2-6	Silty clay, clay, clay loam, silty clay loam	CH	A-7-6	0	0	100	100	90-100	70-95	50-65	30-40
	6-13	Silty clay loam, silty clay, clay loam, clay	CH	A-7-6	0	0	100	100	90-100	70-95	50-65	30-40
	13-22	Silty clay loam, silty clay, silt loam	CH, CL	A-6, A-7-6	0	0	100	100	90-100	70-95	30-60	10-30
	22-28	Silty clay loam, silty clay, silt loam	CH, CL	A-7-6, A-6	0	0	100	100	90-100	70-95	30-60	10-30
	28-60	Bedrock	---	---	0	0	100	100	---	---	---	---
Kremlin----------	0-11	Loam, silt loam	CL	A-6	0	0	90-100	80-100	75-100	65-85	25-35	10-15
	11-19	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	25-40	10-20
	19-60	Loam, silt loam, clay loam	CL	A-6	0	0	95-100	90-100	75-95	55-80	25-40	10-20
205:												
Havre, rarely flooded--------	0-10	Silt loam, loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	10-60	Stratified fine sandy loam to clay loam	CL	A-6, A-7-6	0	0	100	100	70-95	50-75	30-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
206:												
Glendive, rarely flooded	0-5	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0	100	100	65-85	30-55	20-30	4-10
	5-16	Loam, silt loam, sandy loam	CL, SC-SM, SC, SM, CL-ML, ML	A-4	0	0	100	100	65-95	40-70	20-30	3-10
	16-60	Fine sandy loam, stratified loamy fine sand to silt loam	CL-ML, ML, SC, SM, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-80	25-50	15-30	1-10
207:												
Harriet	0-2	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-15
	2-18	Clay loam, silty clay loam, silty clay, clay	CH, CL, ML, MH	A-7	0	0	100	100	90-100	70-100	45-65	20-30
	18-28	Loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-100	30-50	10-25
	28-38	Very fine sandy loam	CL-ML, CL	A-4	0	0	100	100	85-95	50-65	25-30	4-10
	38-40	Clay loam	CL, ML	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	10-20
	40-60	Stratified very fine sandy loam to silty clay	CL, ML, CH	A-5, A-6, A-4, A-7-6	0	0	100	100	90-100	60-100	30-55	7-30
211F:												
Cabba	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock			0	0	98-100	90-100	---	---	20-45	4-20
Badland, outcrop	0-60	Bedrock	CH, CL-ML, SC, SC-SM	A-6, A-7, A-4	0	0	90-100	85-100	75-100	35-95	15-75	5-50

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
211F:(cont.)												
Arikara---------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-5, A-7-6, A-6	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
212:												
Trembles--------	0-9	Fine sandy loam	SC-SM, SC, CL-ML, CL	A-4	0	0	100	100	70-85	40-55	20-30	4-10
	9-59	Stratified fine sandy loam to silt loam	SC-SM, SC, CL-ML, CL	A-4	0	0	100	100	65-85	35-60	20-30	4-10
	59-80	Stratified sand to silt loam	SC-SM, SM, SC	A-2-4, A-4	0	0	100	100	50-70	10-40	15-30	1-10
213:												
Havrelon, slightly wet---	0-13	Silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	13-60	Stratified very fine sandy loam to silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	85-100	60-80	25-45	7-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
214:												
Channel---	---	---	---	---	---	---	---	---	---	---	---	---
Korchea, wooded-	0-6	Silt loam, silty clay loam, fine sandy loam, stratified loam to silty clay loam, loam	CL, SC	A-4, A-6, A-7-6	0	0	95-100	95-100	70-100	40-95	20-45	4-20
	6-60	Stratified fine sandy loam to silty clay loam	CL, SC	A-6, A-7-6	0	0	95-100	95-100	70-100	40-95	25-45	10-20
217:												
Wolf Point,	0-1	Silty clay loam	CL	A-7-6	0	0	100	100	90-100	75-95	45-55	20-35
wooded---	1-10	Silty clay loam, silty clay, clay	CH, CL	A-7-6	0	0	100	100	90-100	75-95	45-75	25-50
	10-60	Silty clay, silty clay loam, clay	CH, CL	A-7-6	0	0	100	100	90-100	75-95	45-75	25-50
218F:												
Cherry---	0-3	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-20
	3-33	Silt loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-45	10-20
	33-60	Silty clay, silty clay loam, silt loam	CH, CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-60	10-30
Cabba---	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
218F:(cont.)												
Brandenburg-----	0-4	Channery loam	CL, CL-ML, GC-GM, SC	A-6, A-2-6, A-2-4, A-4	0	0-5	60-100	40-80	35-75	30-65	20-35	4-15
	4-10	Very channery loam, extremely channery loam, very channery sandy loam	CL, GM, ML, SM, CL-ML	A-2-6, A-4, A-6, A-2-4	0	0-5	45-100	40-80	35-75	30-65	15-35	1-15
	10-60	Channers	GW	A-1-a	0	80-85	15-25	5-10	0-5	0	15-20	NP-1
227:												
Haydraw---------	0-6	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-35	10-15
	6-58	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0-2	95-100	95-100	95-100	90-100	25-45	10-20
	58-80	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	95-100	90-100	25-45	10-20
227B:												
Haydraw---------	0-6	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-35	10-15
	6-58	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0-2	95-100	95-100	95-100	90-100	25-45	10-20
	58-80	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	95-100	90-100	25-45	10-20
231C:												
Patent----------	0-7	Loam, silt loam	CL	A-6	0	0	100	100	70-100	50-85	25-35	10-15
	7-60	Stratified fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	70-100	50-90	25-45	8-20
Gullied land----	0-60	---	---	---	0	0	95-100	85-100	75-95	35-90	20-50	5-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
231C:(cont.)												
Glendive--------	0-5	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0	100	100	65-85	30-55	20-30	4-10
	5-16	Loam, silt loam, sandy loam	SC-SM, CL, SC, SM, CL-ML, ML	A-4	0	0	100	100	65-95	40-70	20-30	3-10
	16-60	Fine sandy loam, stratified loamy fine sand to silt loam	CL-ML, ML, SC, SM, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-80	25-50	15-30	1-10
232C:												
Lambert---------	0-5	Silt loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	5-36	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-90	30-45	10-20
	36-60	Very fine sandy loam, stratified very fine sandy loam to silty clay loam	CL	A-4, A-5, A-6, A-7-6	0	0	100	100	85-95	55-70	25-45	8-20
Slickspots------	0-1	Silty clay	CH	A-7	0	0	100	100	90-100	80-100	50-75	25-50
	1-60	Stratified loam to silty clay	CH	A-7	0	0	100	100	90-100	60-100	20-70	5-40

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
232C:(cont.)												
Rhoades---	0-3	Silt loam, loam	CL	A-6, A-7-6	0	0	100	100	85-100	60-95	30-45	10-25
	3-8	Silty clay, clay loam, clay, silty clay loam	CH	A-7-6	0	0	100	100	90-100	80-95	50-65	25-35
	8-14	Silty clay, clay, clay loam, silty clay loam	CH	A-7-6	0	0	100	100	90-100	75-95	50-65	25-35
	14-46	Silty clay, clay, silty clay loam, clay loam, loam	CH, CL, MH, ML	A-6, A-7-6	0	0	100	100	90-100	70-95	35-60	10-30
	46-60	Silty clay loam, silt loam, loam, clay loam, silty clay	CH, CL, ML	A-6, A-7-6	0	0	100	100	85-100	75-95	35-60	10-30
238B:												
Janesburg---	0-8	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	8-10	Silt loam, loam	CL, SC	A-4, A-6, A-2-6, A-2-4	0	0	100	100	70-100	30-90	25-35	8-15
	10-21	Silty clay, silty clay loam, clay	CH, CL	A-7-6	0	0	100	100	70-100	60-95	45-60	20-30
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-55	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
238B:(cont.)												
Dogtooth--------	0-2	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	30-40	10-15
	2-8	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	8-13	Silty clay, silty clay loam, clay loam	CH	A-7-6	0	0	100	100	70-100	60-95	50-60	20-30
	13-21	Silty clay, silty clay loam, loam	CH, CL	A-6, A-7-6	0	0	100	100	70-100	60-95	30-60	10-30
	21-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60
239D:												
Vebar-----------	0-5	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	5-26	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	26-32	Fine sandy loam, loamy fine sand, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	60-100	30-55	20-30	4-10
	32-60	Bedrock	---	---	---	---	---	---	---	---	10-20	NP-4
Janesburg-------	0-8	Fine sandy loam	CL, SC-SM, SC, CL-ML	A-4, A-2-4	0	0	100	100	70-85	30-60	20-30	4-10
	8-10	Fine sandy loam	ML, CL-ML, CL, SM, SC-SM, SC	A-2-4, A-4	0	0	100	100	70-100	30-90	20-30	3-10
	10-21	Silty clay, silty clay loam, clay	CH, CL	A-7	0	0	100	100	70-100	60-95	45-70	20-35
	21-26	Silt loam, loam, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	70-100	60-95	30-60	10-30
	26-60	Bedrock	---	---	0	0	100	100	---	---	25-100	4-60

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
242F:												
Zahl----------	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Williams--------	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
Arikara---------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-4, A-7-6, A-5, A-6	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
287F:												
Arikara----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
Cabba----------	0-3	Loam, silt loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
299:												
Minnewaukan-----	0-3	Fine sandy loam, sandy loam, coarse sandy loam	SC-SM, SM, SC	A-2-4, A-1-b	0	0	90-100	90-100	40-55	15-35	20-30	NP-10
	3-5	Loamy coarse sand, loamy sand, loamy fine sand	SC-SM, SM	A-2-4	0	0	90-100	70-100	50-85	15-30	10-20	NP-4
	5-60	Stratified fine sand to loamy sand, sand	SM, SP-SM	A-2-4	0	0	90-100	90-100	60-100	5-35	10-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
299:(cont.)												
Banks	0-4	Loamy fine sand, loamy sand	SW-SM, SM	A-4, A-2-4	0	0	100	100	60-80	10-40	15-20	NP-4
	4-30	Sand, fine sand, loamy fine sand	SW-SM, SM	A-2-4	0	0	100	100	50-70	10-25	15-20	NP-4
	30-60	Loamy fine sand, fine sand, sand	SM, SW-SM	A-2-4	0	0	100	100	50-70	10-25	15-20	NP-4
Riverwash	0-6	Gravelly sand	SP, SP-SM, SW, SW-SM	A-1-b, A-2-4, A-3	0	0-5	80-100	75-100	30-60	0-10	10-15	NP-1
	6-60	Stratified gravelly coarse sand to gravelly sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0-5	80-100	75-100	40-70	0-20	10-20	NP-4
317:												
Lallie	0-2	Silty clay, silty clay loam	CL, CH	A-6, A-7-6	0	0	100	100	85-100	60-95	40-65	20-40
	2-24	Silty clay loam, silty clay	CH, CL	A-7-6, A-6	0	0	100	95-100	90-100	85-100	40-60	20-40
	24-32	Silty clay, silty clay loam	CH, CL	A-7-6, A-6	0	0	100	95-100	90-100	85-100	40-65	20-40
	32-60	Silty clay, silty clay loam	CH, CL	A-7-6, A-6	0	0	100	95-100	90-100	85-100	40-65	20-40
331B:												
Cherry	0-3	Silt loam, loam	CL	A-6	0	0	100	100	85-100	60-90	25-35	10-20
	3-33	Silt loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-45	10-20
	33-60	Silty clay, silty clay loam, silt loam	CH, CL	A-6, A-7, A-7-6	0	0	100	100	90-100	80-95	25-60	10-30
Gullied land	0-60	---	---	---	0	0	95-100	85-100	75-95	35-90	20-50	5-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
331B:(cont.)												
Havrelon	0-13	Silt loam	CL	A-6	0	0	100	100	85-100	60-95	25-35	10-15
	13-60	Stratified very fine sandy loam to silty clay loam	CL, CL-ML	A-6, A-4, A-7-6	0	0	100	100	85-100	60-80	25-45	7-20
340B:												
Niobell	0-6	Loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	6-9	Loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	9-19	Clay, clay loam, silty clay	CH, CL	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	19-29	Silty clay, clay, clay loam	CL, CH	A-7	0	0-1	95-100	90-100	85-100	65-85	40-60	15-30
	29-60	Loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
341B:												
Noonan	0-6	Loam, silt loam	CL	A-6	0-1	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	6-9	Clay loam	CL	A-6, A-7-6	0-1	0-1	95-100	95-100	85-95	65-85	35-50	15-25
	9-12	Clay loam	CL	A-6, A-7-6	0-1	0-1	95-100	95-100	85-95	65-85	35-50	15-25
	12-20	Clay loam	CL	A-6, A-7-6	0-1	0-1	95-100	95-100	85-95	65-85	35-45	15-20
	20-28	Loam, clay loam	CL	A-6, A-7-6	0-1	0-1	90-100	85-100	75-95	60-85	25-45	10-20
	28-60	Loam, clay loam	CL	A-6, A-7-6	0-1	0-1	90-100	85-100	75-95	60-85	25-45	10-20
Niobell	0-6	Loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	6-9	Loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	9-19	Clay, clay loam, silty clay	CH, CL	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	19-29	Silty clay, clay, clay loam	CL, CH	A-7	0	0-1	95-100	90-100	85-100	65-85	40-60	15-30
	29-60	Loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
341B:(cont.)												
Williams--------	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
341C:												
Noonan----------	0-6	Loam, silt loam	CL	A-6	0-1	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	6-9	Clay loam	CL	A-6, A-7-6	0-1	0-1	95-100	95-100	85-95	65-85	35-50	15-25
	9-12	Clay loam	CL	A-6, A-7-6	0-1	0-1	95-100	95-100	85-95	65-85	35-50	15-25
	12-20	Clay loam	CL	A-6, A-7-6	0-1	0-1	95-100	95-100	85-95	65-85	35-45	15-20
	20-28	Loam, clay loam	CL	A-6, A-7-6	0-1	0-1	90-100	85-100	75-95	60-85	25-45	10-20
	28-60	Loam, clay loam	CL	A-6, A-7-6	0-1	0-1	90-100	85-100	75-95	60-85	25-45	10-20
Williams--------	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
403F:												
Rhame-----------	0-8	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	8-26	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	26-34	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-30	3-10
	34-60	Bedrock	---	---	---	---	---	---	---	---	5-20	NP-5

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
403F:(cont.)												
Arikara	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	95-100	---	---
	1-2	Loam, clay loam	CL	A-6, A-7-6, A-5	0	0	100	100	85-100	70-80	30-45	10-20
	2-14	Loam, clay loam, silt loam, silty clay loam	CL	A-7-6, A-6, A-5	0	0	85-100	80-100	70-100	50-85	30-45	10-20
	14-39	Loam, fine sandy loam, silty clay loam, clay loam	SC-SM, CL	A-6, A-4, A-7-6, A-5	0	0	85-100	80-100	70-100	50-90	25-45	8-20
	39-60	Loam, clay loam, fine sandy loam, silt loam	CL, SC, SC-SM	A-4, A-6, A-7-6, A-5	0	0	85-100	80-100	70-100	40-90	25-45	8-20
Fleak	0-3	Loamy fine sand	SC-SM, SM	A-1, A-4, A-2	0	0	95-100	95-100	45-80	20-40	15-20	NP-4
	3-17	Loamy fine sand, fine sand	SM	A-1, A-2, A-4	0	0	95-100	95-100	40-85	20-40	15-20	NP-4
	17-60	Bedrock	---	---	---	---	---	---	---	---	15-20	NP-4
404F:												
Badland, outcrop	0-60	Bedrock	CH, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	0	90-100	85-100	75-100	35-95	15-75	5-50
Lambert	0-5	Silt loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	5-36	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-90	30-45	10-20
	36-60	Very fine sandy loam, stratified very fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	85-95	55-70	25-45	8-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
404F:(cont.)												
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
406:												
Glendive, wooded	0-5	Fine sandy loam, sandy loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0	100	100	65-85	30-55	20-30	4-10
	5-16	Loam, silt loam, sandy loam	SC-SM, CL, SC, SM, CL-ML, ML	A-4	0	0	100	100	65-95	40-70	20-30	3-10
	16-60	Fine sandy loam, stratified loamy fine sand to silt loam	CL-ML, ML, SC, SM, SC-SM	A-2-4, A-4	0	0	95-100	90-100	60-80	25-50	15-30	1-10
408B:												
Hanly, wooded	0-5	Fine sandy loam, sandy loam	CL-ML, SC-SM, SC, CL	A-4, A-2-4	0	0	100	100	70-85	30-55	20-30	4-10
	5-60	Stratified sand to fine sandy loam	SM, SP-SM	A-3, A-4, A-2-4	0	0	100	100	50-85	5-40	15-20	NP-4
410:												
Riverwash	0-6	Gravelly sand	SP, SP-SM, SW, SW-SM	A-1-b, A-2-4, A-3	0	0-5	80-100	75-100	30-60	0-10	10-15	NP-1
	6-60	Stratified gravelly coarse sand to gravelly sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0-5	80-100	75-100	40-70	0-20	10-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
411B:												
Lambert	0-5	Silt loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	5-36	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-90	30-45	10-20
	36-60	Very fine sandy loam, stratified very fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	85-95	55-70	25-45	8-20
412E:												
Lambert	0-5	Silt loam	CL	A-6	0	0	100	100	90-100	75-90	25-35	10-15
	5-36	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	80-90	30-45	10-20
	36-60	Very fine sandy loam, stratified very fine sandy loam to silty clay loam	CL	A-4, A-6, A-7-6, A-5	0	0	100	100	85-95	55-70	25-45	8-20
Brandenburg	0-4	Channery loam	CL, CL-ML, GC-GM, SC	A-6, A-2-6, A-2-4, A-4	0	0-5	60-100	40-80	35-75	30-65	20-35	4-15
	4-10	Very channery loam, extremely channery loam, very channery sandy loam	CL, GM, ML, SM, CL-ML	A-2-6, A-4, A-6, A-2-4	0	0-5	45-100	40-80	35-75	30-65	15-35	1-15
	10-60	Channers	GW	A-1-a	0	80-85	15-25	5-10	0-5	0	15-20	NP-1
442F:												
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
442F:(cont.)												
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
460C:												
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
460D:												
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Cabba	0-3	Silt loam, loam	CL	A-6	0	0-5	90-100	85-100	70-90	60-80	25-35	10-15
	3-15	Silt loam, loam, silty clay loam, clay loam	CL	A-6, A-7-6	0	0-5	95-100	90-100	85-100	80-95	30-45	10-20
	15-60	Bedrock	---	---	0	0	98-100	90-100	---	---	20-45	4-20
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
470C:												
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Tally	0-6	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	55-100	25-55	20-30	4-10
	6-32	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	60-100	25-50	20-30	4-10
	32-60	Fine sandy loam, sandy loam, loamy fine sand	SC, SC-SM, CL, CL-ML, SM, ML	A-2-4, A-4	0	0	90-100	80-100	60-100	15-50	15-30	1-10
Williams	0-6	Loam	CL	A-4, A-6	0-2	0-5	95-100	95-100	85-95	60-90	25-35	8-15
	6-10	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	10-15	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	15-24	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	35-45	15-25
	24-36	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
	36-60	Clay loam, loam	CL	A-6, A-7-6	0-2	0-5	95-100	95-100	80-100	60-80	30-45	10-20
470D:												
Zahl	0-5	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-35	10-15
	5-20	Loam, clay loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
	20-60	Clay loam, loam	CL	A-6	0	0-1	90-100	85-100	80-95	55-80	30-40	10-20
Beisigl	0-5	Loamy fine sand, loamy sand	SM	A-4, A-2-4	0	0	95-100	85-100	75-95	20-40	15-20	NP-4
	5-27	Loamy fine sand, loamy sand, fine sand	SM	A-2-4	0	0	95-100	85-100	50-100	15-35	15-20	NP-4
	27-60	Bedrock			---	---	---	---	---	---	15-20	NP-4
Tally	0-6	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	55-100	25-55	20-30	4-10
	6-32	Fine sandy loam, sandy loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	0	90-100	80-100	60-100	25-50	20-30	4-10
	32-60	Fine sandy loam, sandy loam, loamy fine sand	SC, SC-SM, CL, CL-ML, SM, ML	A-2-4, A-4	0	0	90-100	80-100	60-100	15-50	15-30	1-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
490:												
Riverwash-------	0-6	Gravelly sand	---	---	0	0-5	80-100	75-100	30-60	0-10	0-14	NP
	6-60	Stratified gravelly coarse sand to gravelly sandy loam, stratified coarse sand to sandy loam			0	0-5	80-100	75-100	40-70	0-20	0-14	NP
496:												
Pits, gravel and sand, low precipitation--	0-6	Extremely gravelly sand	GW-GM, SW-SM	A-1, A-3	0	0-5	25-90	10-65	5-55	0-25	0-15	NP-5
	6-60	Extremely gravelly sand, extremely gravelly coarse sand, gravelly coarse sandy loam	GW-GM, SW-SM	A-1, A-3	0	0-10	25-90	10-65	5-55	0-25	0-15	NP-5
M-W:												
Miscellaneous water----------	---	---	---	---	---	---	---	---	---	---	---	---
W:												
Water----------	---	---	---	---	---	---	---	---	---	---	---	---

Physical Properties of the Soils

(The symbol < means less than; > means greater than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Dashes (---) indicate that data were not available or were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
2:												
Heil	0-3	40-50	1.20-1.40	0.06-0.2	0.13-0.18	6.0-8.9	3.0-6.0	.28	.28	2	4	86
	3-24	45-60	1.20-1.55	0.001-0.06	0.13-0.19	6.0-8.9	0.0-1.0	.37	.37			
	24-38	27-50	1.30-1.60	0.001-0.2	0.13-0.19	6.0-8.9	0.0-0.5	.37	.37			
	38-52	27-50	1.30-1.60	0.001-0.2	0.13-0.19	6.0-8.9	0.0-0.5	.37	.37			
	52-60	20-50	1.30-1.60	0.001-2	0.13-0.19	6.0-8.9	0.0-0.5	.32	.32			
3:												
Dimmick	0-3	0-15	0.08-0.25	0.6-6	0.55-0.65	---	75-100	.02	.02	5	4	86
	3-6	27-40	1.00-1.40	0.01-0.2	0.14-0.23	6.0-8.9	3.0-8.0	.37	.37			
	6-23	40-50	1.00-1.40	0.001-0.2	0.14-0.23	6.0-8.9	2.0-4.0	.28	.28			
	23-63	40-60	1.30-1.60	0.001-0.06	0.13-0.20	6.0-8.9	0.0-2.0	.28	.28			
5:												
Tonka	0-13	18-27	1.00-1.50	0.6-2	0.20-0.24	0.0-2.9	5.0-10	.37	.37	5	6	48
	13-19	15-25	1.00-1.50	0.6-2	0.17-0.22	0.0-2.9	2.0-5.0	.37	.37			
	19-34	35-45	1.40-1.65	0.06-0.2	0.14-0.18	6.0-8.9	0.0-2.0	.43	.43			
	34-50	35-45	1.40-1.65	0.06-0.2	0.13-0.16	3.0-5.9	0.0-1.0	.37	.37			
	50-60	18-40	1.40-1.65	0.06-2	0.14-0.20	3.0-5.9	0.0-1.0	.28	.28			
Hamerly	0-8	18-27	1.20-1.60	0.6-2	0.18-0.24	3.0-5.9	4.0-7.0	.24	.24	5	4L	86
	8-25	18-35	1.30-1.60	0.6-2	0.15-0.19	3.0-5.9	1.0-3.0	.28	.28			
	25-60	18-35	1.30-1.60	0.2-0.6	0.14-0.19	3.0-5.9	0.0-0.5	.37	.37			
7:												
Harriet	0-2	12-27	1.10-1.40	0.2-2	0.20-0.24	0.0-2.9	3.0-6.0	.37	.37	2	6	48
	2-18	35-50	1.20-1.60	0.001-0.06	0.10-0.15	6.0-8.9	1.0-3.0	.37	.37			
	18-28	18-40	1.20-1.60	0.6-2	0.10-0.15	3.0-5.9	0.5-1.0	.37	.37			
	28-38	10-18	1.40-1.60	0.6-2	0.09-0.15	0.0-2.9	0.0-1.0	.37	.37			
	38-40	23-35	1.35-1.55	0.6-2	0.09-0.12	3.0-5.9	0.0-0.5	.32	.32			
	40-60	15-45	1.20-1.60	0.06-0.2	0.09-0.12	3.0-5.9	0.0-0.5	.32	.32			
9:												
Grano	0-3	0-15	0.08-0.25	0.6-6	0.55-0.65	---	75-100	.02	.02	5	4	86
	3-19	40-60	1.30-1.50	0.06-0.2	0.15-0.18	6.0-8.9	4.0-9.0	.28	.28			
	19-51	40-60	1.30-1.50	0.06-0.2	0.14-0.17	6.0-8.9	0.0-1.0	.28	.28			
	51-63	35-60	1.30-1.50	0.06-0.2	0.13-0.16	6.0-8.9	0.0-0.5	.37	.37			
10:												
Banks	0-10	10-18	1.30-1.50	2-6	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	10-60	1-10	1.40-1.70	6-20	0.05-0.12	0.0-2.9	0.0-0.5	.17	.17			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
10D:												
Seroco	0-3	1-10	1.10-1.50	6-20	0.10-0.12	0.0-2.9	1.0-2.0	.17	.17	5	2	134
	3-60	1-10	1.30-1.70	6-20	0.06-0.08	0.0-2.9	0.0-0.5	.15	.15			
Lohler	0-8	40-60	1.10-1.30	0.06-0.6	0.15-0.18	6.0-8.9	0.5-3.0	.28	.28	5	4	86
	8-60	35-60	1.20-1.50	0.06-0.2	0.13-0.17	6.0-8.9	0.0-0.5	.28	.28			
11B:												
Patent	0-7	18-27	1.10-1.40	0.6-2	0.16-0.22	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	7-60	15-35	1.20-1.60	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
12:												
Trembles	0-9	10-18	1.20-1.40	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	9-59	10-18	1.35-1.55	0.6-6	0.14-0.20	0.0-2.9	0.5-1.0	.20	.20			
	59-80	5-18	1.45-1.65	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
13:												
Havrelon	0-13	18-27	1.10-1.50	0.6-2	0.20-0.24	3.0-5.9	0.5-1.0	.32	.32	5	4L	86
	13-60	15-35	1.30-1.70	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			
14:												
Channel	---	---	---	---	---	---	---	---	---	-	---	---
Korchea	0-6	10-35	1.10-1.50	0.2-2	0.16-0.24	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	6-60	18-35	1.30-1.60	0.2-2	0.15-0.20	3.0-5.9	0.0-2.0	.28	.28			
15:												
Korchea	0-6	10-35	1.10-1.50	0.2-2	0.16-0.24	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	6-60	18-35	1.30-1.60	0.2-2	0.15-0.20	3.0-5.9	0.0-2.0	.28	.28			
16:												
Ridgelawn	0-9	18-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.37	.37	3	4L	86
	9-29	18-35	1.20-1.50	0.6-2	0.16-0.22	3.0-5.9	0.5-1.0	.37	.37			
	29-80	1-10	1.45-1.65	6-20	0.05-0.12	0.0-2.9	0.5-1.0	.15	.24			
17:												
Lohler	0-8	40-60	1.10-1.30	0.06-0.6	0.15-0.18	6.0-8.9	0.5-3.0	.28	.28	5	4	86
	8-60	35-60	1.20-1.50	0.06-0.2	0.13-0.17	6.0-8.9	0.0-0.5	.28	.28			
19:												
Hoffmanville	0-8	40-60	1.20-1.40	0.06-0.2	0.15-0.18	6.0-8.9	1.0-2.0	.32	.32	3	4	86
	8-26	35-60	1.30-1.50	0.06-0.2	0.14-0.20	6.0-8.9	0.5-1.0	.32	.32			
	26-50	5-18	1.50-1.70	6-20	0.05-0.12	0.0-2.9	0.5-1.0	.15	.24			
	50-61	27-50	1.30-1.50	0.06-0.2	0.13-0.20	6.0-8.9	0.0-0.5	.32	.32			
	61-80	10-27	1.30-1.60	0.6-6	0.14-0.22	0.0-2.9	0.0-0.5	.24	.24			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
20:												
Scorio	0-8	40-60	1.10-1.30	0.001-0.2	0.15-0.18	6.0-8.9	0.5-3.0	.32	.32	5	4	86
	8-32	35-60	1.20-1.50	0.001-0.6	0.14-0.18	6.0-8.9	0.0-0.5	.32	.32			
	32-60	7-18	1.20-1.50	2-6	0.05-0.19	0.0-2.9	0.0-0.5	.24	.24			
21B:												
Tally	0-6	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	6-32	10-18	1.30-1.60	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.20	.20			
	32-60	5-18	1.30-1.60	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
Parshall	0-12	10-18	1.20-1.60	2-6	0.16-0.18	0.0-2.9	1.0-4.0	.20	.20	5	3	86
	12-29	10-18	1.30-1.60	2-6	0.13-0.17	0.0-2.9	1.0-3.0	.20	.20			
	29-48	5-18	1.30-1.60	2-6	0.12-0.17	0.0-2.9	0.0-1.0	.24	.24			
	48-60	5-18	1.40-1.60	6-20	0.10-0.12	0.0-2.9	0.0-1.0	.17	.17			
21C:												
Tally	0-6	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	6-32	10-18	1.30-1.60	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.20	.20			
	32-60	5-18	1.30-1.60	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
Parshall	0-12	10-18	1.20-1.60	2-6	0.16-0.18	0.0-2.9	1.0-4.0	.20	.20	5	3	86
	12-29	10-18	1.30-1.60	2-6	0.12-0.17	0.0-2.9	1.0-3.0	.20	.20			
	29-48	5-18	1.30-1.60	2-6	0.12-0.17	0.0-2.9	0.0-1.0	.24	.24			
	48-60	5-18	1.40-1.60	6-20	0.10-0.12	0.0-2.9	0.0-1.0	.17	.17			
22:												
Velva	0-6	10-18	1.20-1.50	0.6-6	0.13-0.18	0.0-2.9	4.0-8.0	.20	.20	5	3	86
	6-13	10-20	1.20-1.50	0.6-6	0.12-0.17	0.0-2.9	2.0-4.0	.20	.20			
	13-60	10-20	1.30-1.60	0.6-6	0.11-0.15	0.0-2.9	0.0-2.0	.20	.20			
23B:												
Lihen	0-9	1-10	1.25-1.60	6-20	0.06-0.18	0.0-2.9	1.0-3.0	.17	.17	5	2	134
	9-24	1-10	1.25-1.60	6-20	0.06-0.18	0.0-2.9	1.0-3.0	.17	.17			
	24-32	1-10	1.25-1.45	6-20	0.06-0.12	0.0-2.9	1.0-2.0	.17	.17			
	32-60	1-10	1.40-1.60	6-20	0.05-0.12	0.0-2.9	0.0-0.5	.17	.17			
Parshall	0-12	10-18	1.20-1.60	2-6	0.16-0.18	0.0-2.9	1.0-4.0	.20	.20	5	3	86
	12-29	10-18	1.30-1.60	2-6	0.12-0.17	0.0-2.9	1.0-3.0	.20	.20			
	29-48	5-18	1.30-1.60	2-6	0.12-0.17	0.0-2.9	0.0-1.0	.24	.24			
	48-60	5-18	1.40-1.60	6-20	0.10-0.12	0.0-2.9	0.0-1.0	.17	.17			
23D:												
Beisigl	0-5	3-10	1.20-1.50	6-20	0.11-0.13	0.0-2.9	1.0-3.0	.17	.17	3	2	134
	5-27	1-10	1.30-1.70	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.20			
	27-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
23D:(cont.)												
Telfer	0-6	1-10	1.40-1.70	6-20	0.10-0.12	0.0-2.9	1.0-3.0	.17	.17	5	2	134
	6-60	1-10	1.40-1.70	6-20	0.06-0.10	0.0-2.9	0.0-1.0	.17	.17			
24:												
Arnegard	0-13	18-27	1.00-1.40	0.6-2	0.18-0.20	0.0-2.9	3.0-6.0	.24	.24	5	6	48
	13-36	18-30	1.20-1.60	0.6-2	0.16-0.22	0.0-2.9	1.0-4.0	.28	.28			
	36-60	15-30	1.20-1.60	0.6-2	0.14-0.18	0.0-2.9	0.0-1.0	.28	.28			
25:												
Farnuf	0-9	18-27	1.20-1.40	0.6-2	0.18-0.20	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	9-23	25-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.28			
	23-34	18-35	1.20-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32			
	34-60	15-35	1.25-1.45	0.6-2	0.15-0.20	3.0-5.9	0.0-0.5	.32	.32			
25B:												
Farnuf	0-9	18-27	1.20-1.40	0.6-2	0.18-0.20	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	9-23	25-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.28			
	23-34	18-35	1.20-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32			
	34-60	15-35	1.25-1.45	0.6-2	0.15-0.20	3.0-5.9	0.0-0.5	.32	.32			
25C:												
Farnuf	0-9	18-27	1.20-1.40	0.6-2	0.18-0.20	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	9-23	25-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.28			
	23-34	18-35	1.20-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32			
	34-60	15-35	1.20-1.50	0.6-2	0.15-0.20	3.0-5.9	0.0-0.5	.32	.32			
26:												
Tansem	0-6	18-27	1.10-1.30	0.6-2	0.19-0.22	3.0-5.9	2.0-5.0	.32	.32	5	6	48
	6-14	18-27	1.10-1.30	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.28	.28			
	14-28	18-27	1.10-1.30	0.6-2	0.17-0.19	3.0-5.9	1.0-2.0	.28	.28			
	28-60	10-27	1.20-1.50	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.28	.28			
Roseglen	0-7	18-27	1.10-1.30	0.6-2	0.20-0.24	3.0-5.9	4.0-8.0	.32	.32	5	6	48
	7-24	18-27	1.20-1.40	0.6-2	0.17-0.22	3.0-5.9	2.0-4.0	.32	.32			
	24-34	18-27	1.20-1.50	0.6-2	0.17-0.22	3.0-5.9	1.0-2.0	.43	.43			
	34-60	18-27	1.20-1.50	0.6-2	0.17-0.22	3.0-5.9	0.0-2.0	.43	.43			
26B:												
Tansem	0-6	18-27	1.10-1.30	0.6-2	0.19-0.22	3.0-5.9	2.0-5.0	.32	.32	5	6	48
	6-14	18-27	1.10-1.30	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.28	.28			
	14-28	18-27	1.10-1.30	0.6-2	0.17-0.19	3.0-5.9	1.0-2.0	.28	.28			
	28-60	10-27	1.20-1.50	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
26B:(cont.)												
Roseglen	0-7	18-27	1.10-1.30	0.6-2	0.20-0.24	3.0-5.9	4.0-8.0	.32	.32	5	6	48
	7-24	18-27	1.20-1.40	0.6-2	0.17-0.22	3.0-5.9	2.0-4.0	.32	.32			
	24-34	18-27	1.20-1.50	0.6-2	0.17-0.22	3.0-5.9	1.0-2.0	.43	.43			
	34-60	18-27	1.20-1.50	0.6-2	0.17-0.22	3.0-5.9	0.0-2.0	.43	.43			
27:												
Golva	0-5	18-27	1.20-1.50	0.6-2	0.20-0.23	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	5-15	18-35	1.10-1.30	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.32	.32			
	15-21	18-35	1.10-1.30	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.32	.32			
	21-40	18-30	1.20-1.50	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.43	.43			
	40-60	18-30	1.20-1.50	0.6-2	0.16-0.19	3.0-5.9	0.0-1.0	.43	.43			
27B:												
Golva	0-5	18-27	1.20-1.50	0.6-2	0.20-0.23	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	5-15	18-35	1.10-1.30	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.32	.32			
	15-21	18-35	1.10-1.30	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.32	.32			
	21-40	18-30	1.20-1.50	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.43	.43			
	40-60	18-30	1.20-1.50	0.6-2	0.16-0.19	3.0-5.9	0.0-1.0	.43	.43			
27C:												
Golva	0-5	18-27	1.20-1.50	0.6-2	0.20-0.23	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	5-15	18-35	1.10-1.30	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.32	.32			
	15-21	18-35	1.10-1.30	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.32	.32			
	21-40	18-30	1.20-1.50	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.43	.43			
	40-60	18-30	1.20-1.50	0.6-2	0.16-0.19	3.0-5.9	0.0-1.0	.43	.43			
29:												
Savage	0-7	27-40	1.15-1.35	0.2-0.6	0.18-0.23	3.0-5.9	1.0-5.0	.32	.32	5	7	38
	7-25	35-50	1.25-1.50	0.06-0.6	0.17-0.20	6.0-8.9	1.0-2.0	.32	.32			
	25-51	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	51-80	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.0-0.5	.43	.43			
29B:												
Savage	0-7	27-40	1.15-1.35	0.2-0.6	0.18-0.23	3.0-5.9	1.0-5.0	.32	.32	5	7	38
	7-25	35-50	1.25-1.50	0.06-0.6	0.17-0.20	6.0-8.9	1.0-2.0	.32	.32			
	25-51	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	51-80	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.0-0.5	.43	.43			
29C:												
Savage	0-7	27-40	1.15-1.35	0.2-0.6	0.18-0.23	3.0-5.9	1.0-5.0	.32	.32	5	7	38
	7-25	35-50	1.25-1.50	0.06-0.6	0.17-0.20	6.0-8.9	1.0-2.0	.32	.32			
	25-51	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	51-60	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
30:												
Lawther	0-10	40-60	1.10-1.30	0.06-0.2	0.15-0.18	6.0-8.9	2.0-4.0	.28	.28	5	4	86
	10-33	35-60	1.25-1.60	0.06-0.2	0.13-0.18	6.0-8.9	0.5-1.0	.32	.32			
	33-47	35-60	1.25-1.60	0.06-0.2	0.12-0.16	6.0-8.9	0.0-0.5	.32	.32			
	47-60	27-60	1.30-1.60	0.06-0.6	0.09-0.13	6.0-8.9	0.0-0.5	.32	.32			
31B:												
Cherry	0-3	18-27	1.10-1.50	0.6-2	0.20-0.24	0.1-2.9	0.5-3.0	.37	.37	5	4L	86
	3-33	18-35	1.20-1.60	0.06-0.6	0.16-0.22	3.0-5.9	0.5-2.0	.37	.37			
	33-60	18-50	1.40-1.70	0.06-0.6	0.13-0.22	3.0-5.9	0.0-1.0	.37	.37			
31C:												
Cherry	0-3	18-27	1.10-1.50	0.6-2	0.20-0.24	0.1-2.9	0.5-3.0	.37	.37	5	4L	86
	3-33	18-35	1.20-1.60	0.06-0.6	0.16-0.22	3.0-5.9	0.5-2.0	.37	.37			
	33-60	18-50	1.40-1.70	0.06-0.6	0.13-0.22	3.0-5.9	0.0-1.0	.37	.37			
32F:												
Cherry	0-3	18-27	1.10-1.50	0.6-2	0.20-0.24	0.1-2.9	0.5-3.0	.37	.37	5	4L	86
	3-33	18-35	1.20-1.60	0.06-0.6	0.16-0.22	3.0-5.9	0.5-2.0	.37	.37			
	33-60	18-50	1.40-1.70	0.06-0.6	0.13-0.22	3.0-5.9	0.0-1.0	.37	.37			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
33:												
Belfield	0-9	27-35	1.00-1.20	0.2-2	0.17-0.22	3.0-6.0	2.0-6.0	.37	.37	5	7	38
	9-12	27-35	1.20-1.40	0.2-2	0.17-0.22	3.0-6.0	2.0-6.0	.37	.37			
	12-17	35-45	1.20-1.40	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.37	.37			
	17-24	35-45	1.20-1.40	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.37	.37			
	24-43	27-45	1.30-1.50	0.06-0.2	0.13-0.16	6.0-8.9	0.0-0.5	.43	.43			
	43-60	27-45	1.30-1.50	0.06-0.2	0.13-0.16	6.0-8.9	0.0-0.5	.43	.43			
Grail	0-10	27-35	1.10-1.40	0.2-0.6	0.20-0.23	3.0-5.9	4.0-6.0	.37	.37	5	7	38
	10-24	35-45	1.20-1.50	0.06-0.6	0.14-0.20	6.0-8.9	2.0-4.0	.37	.37			
	24-52	27-45	1.20-1.50	0.06-0.6	0.14-0.20	6.0-8.9	0.1-2.0	.37	.37			
	52-60	18-45	1.20-1.50	0.06-0.6	0.13-0.22	3.0-5.9	0.1-1.0	.37	.37			
33B:												
Belfield	0-9	27-35	1.00-1.20	0.2-2	0.17-0.22	3.0-6.0	2.0-6.0	.37	.37	5	7	38
	9-12	27-35	1.20-1.40	0.2-2	0.17-0.22	3.0-6.0	2.0-6.0	.37	.37			
	12-17	35-45	1.20-1.40	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.37	.37			
	17-24	35-45	1.20-1.40	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.37	.37			
	24-43	27-45	1.30-1.50	0.06-0.2	0.13-0.16	6.0-8.9	0.0-0.5	.43	.43			
	43-60	27-45	1.30-1.50	0.06-0.2	0.13-0.16	6.0-8.9	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
33B:(cont.)												
Savage	0-7	27-40	1.15-1.35	0.2-0.6	0.18-0.23	3.0-5.9	1.0-5.0	.32	.32	5	7	38
	7-25	35-50	1.25-1.50	0.06-0.6	0.17-0.20	6.0-8.9	1.0-2.0	.32	.32			
	25-51	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	51-80	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.0-0.5	.43	.43			
34B:												
Daglum	0-7	18-27	1.00-1.20	0.6-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	7-8	18-27	1.20-1.40	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32			
	8-18	35-60	1.20-1.40	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.32	.32			
	18-32	35-60	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	0.5-1.0	.32	.32			
	32-47	35-60	1.30-1.45	0.2-2	0.12-0.14	6.0-8.9	0.0-1.0	.32	.32			
	47-60	35-60	1.30-1.45	0.2-2	0.12-0.14	6.0-8.9	0.0-1.0	.32	.32			
Belfield	0-9	18-27	1.00-1.20	0.2-2	0.20-0.23	3.0-6.0	2.0-6.0	.32	.32	5	6	48
	9-12	27-35	1.20-1.40	0.2-2	0.17-0.22	3.0-6.0	2.0-6.0	.37	.37			
	12-17	35-45	1.20-1.40	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.37	.37			
	17-24	35-45	1.20-1.40	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.37	.37			
	24-43	27-45	1.30-1.50	0.06-0.2	0.13-0.16	6.0-8.9	0.0-0.5	.43	.43			
	43-60	27-45	1.30-1.50	0.06-0.2	0.13-0.16	6.0-8.9	0.0-0.5	.43	.43			
36B:												
Rhoades	0-3	18-27	1.10-1.30	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	3-8	35-50	1.20-1.40	0.001-0.2	0.10-0.12	6.0-8.9	0.5-2.0	.28	.28			
	8-14	35-50	1.25-1.50	0.001-0.2	0.10-0.12	6.0-8.9	0.5-2.0	.32	.32			
	14-46	20-50	1.30-1.50	0.001-2	0.10-0.12	6.0-8.9	0.0-0.5	.32	.32			
	46-60	20-45	1.30-1.50	0.001-2	0.10-0.12	6.0-8.9	0.0-0.5	.32	.32			
Daglum	0-7	18-27	1.00-1.20	0.6-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	7-8	18-27	1.20-1.40	0.2-2	0.12-0.14	0.0-2.9	1.0-3.0	.32	.32			
	8-18	35-60	1.20-1.40	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.32	.32			
	18-32	35-60	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	0.0-1.0	.32	.32			
	32-47	35-60	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	0.0-1.0	.32	.32			
	47-60	20-45	1.30-1.45	0.001-2	0.12-0.14	3.0-5.9	0.0-0.5	.32	.32			
38B:												
Dogtooth	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	2-8	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	8-13	35-50	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	0.5-2.0	.32	.32			
	13-21	18-50	1.20-1.50	0.001-0.6	0.10-0.16	6.0-8.9	0.5-1.0	.32	.32			
	21-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
38B:(cont.)												
Janesburg	0-8	18-27	1.00-1.20	0.2-0.6	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	8-10	15-27	1.20-1.40	0.2-2	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
38F:												
Dogtooth	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	2-8	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	8-13	35-50	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	0.5-2.0	.32	.32			
	13-21	18-50	1.20-1.50	0.001-0.6	0.10-0.16	6.0-8.9	0.5-1.0	.32	.32			
	21-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Janesburg	0-8	18-27	1.00-1.20	0.2-0.6	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	8-10	15-27	1.20-1.40	0.2-2	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
40B:												
Desart	0-20	10-18	1.20-1.50	2-6	0.13-0.17	0.0-2.9	1.0-2.0	.20	.20	3	3	86
	20-24	5-15	1.20-1.50	0.6-6	0.09-0.13	0.0-2.9	0.5-2.0	.20	.20			
	24-31	10-18	1.50-1.70	0.001-0.2	0.12-0.14	0.0-2.9	0.5-1.0	.32	.32			
	31-60	5-20	1.30-1.60	0.06-6	0.08-0.10	0.0-2.9	0.0-0.5	.32	.32			
Janesburg	0-8	18-27	1.00-1.20	0.6-2	0.20-0.22	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	8-10	15-27	1.20-1.40	0.2-2	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Ekalaka	0-6	10-18	1.30-1.50	2-6	0.16-0.18	0.0-2.9	1.0-2.0	.24	.24	2	3	86
	6-12	5-18	1.35-1.55	0.6-6	0.16-0.18	0.0-2.9	1.0-2.0	.24	.24			
	12-17	10-18	1.50-1.70	0.001-0.2	0.11-0.13	0.0-2.9	0.0-1.0	.24	.24			
	17-33	5-18	1.40-1.60	0.6-6	0.14-0.16	0.0-2.9	0.0-1.0	.24	.24			
	33-60	5-18	1.45-1.60	0.6-6	0.06-0.10	0.0-2.9	0.0-0.5	.24	.24			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
41:												
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
Bowbells	0-6	18-27	1.10-1.40	0.6-2	0.17-0.19	0.0-2.9	2.0-6.0	.24	.24	5	6	48
	6-14	18-35	1.20-1.50	0.6-2	0.16-0.22	3.0-5.9	2.0-4.0	.28	.28			
	14-23	18-35	1.20-1.50	0.6-2	0.16-0.22	3.0-5.9	2.0-4.0	.28	.28			
	23-36	18-35	1.30-1.70	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.37	.37			
	36-60	18-35	1.30-1.70	0.2-0.6	0.14-0.18	3.0-5.9	0.0-1.0	.37	.37			
41B:												
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
Bowbells	0-6	18-27	1.10-1.40	0.6-2	0.17-0.19	0.0-2.9	2.0-6.0	.24	.24	5	6	48
	6-14	18-35	1.20-1.50	0.6-2	0.16-0.22	3.0-5.9	2.0-4.0	.28	.28			
	14-23	18-35	1.20-1.50	0.6-2	0.16-0.22	3.0-5.9	2.0-4.0	.28	.28			
	23-36	18-35	1.30-1.70	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.37	.37			
	36-60	18-35	1.30-1.70	0.2-0.6	0.14-0.18	3.0-5.9	0.0-1.0	.37	.37			
42B:												
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
42C:												
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
43C:												
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
44D:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
44E:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
45F:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Maschetah	0-7	20-27	1.10-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-4.0	.32	.32	5	4L	86
	7-48	20-35	1.20-1.40	0.2-0.6	0.18-0.20	3.0-5.9	0.5-3.0	.37	.37			
	48-90	20-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37			
46B:												
Dooley	0-6	10-18	1.10-1.40	2-6	0.13-0.16	0.0-2.9	2.0-4.0	.24	.24	5	3	86
	6-15	20-35	1.20-1.60	0.6-2	0.13-0.17	3.0-5.9	0.0-2.0	.32	.32			
	15-24	15-25	1.20-1.60	2-6	0.13-0.16	0.0-2.9	0.0-1.0	.24	.24			
	24-60	25-45	1.20-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-0.5	.32	.32			
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
46C:												
Dooley	0-6	10-18	1.10-1.40	2-6	0.13-0.16	0.0-2.9	2.0-4.0	.24	.24	5	3	86
	6-15	20-35	1.20-1.60	0.6-2	0.13-0.17	3.0-5.9	0.0-2.0	.32	.32			
	15-24	15-25	1.20-1.60	2-6	0.13-0.16	0.0-2.9	0.0-1.0	.24	.24			
	24-60	25-45	1.20-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-0.5	.32	.32			
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
46D:												
Dooley	0-6	10-18	1.10-1.40	2-6	0.13-0.16	0.0-2.9	2.0-4.0	.24	.24	5	3	86
	6-15	20-35	1.20-1.60	0.6-2	0.13-0.17	3.0-5.9	0.0-2.0	.32	.32			
	15-24	15-25	1.20-1.60	2-6	0.13-0.16	0.0-2.9	0.0-1.0	.24	.24			
	24-60	25-45	1.20-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-0.5	.32	.32			
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
48:												
Temvik	0-7	18-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-6.0	.32	.32	5	6	48
	7-24	18-30	1.10-1.50	0.6-2	0.20-0.22	0.0-2.9	0.5-2.0	.43	.43			
	24-44	18-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.0	.43	.43			
	44-60	18-35	1.35-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.0-1.0	.43	.43			
Wilton	0-8	18-27	1.10-1.40	0.6-2	0.22-0.24	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	8-27	18-27	1.20-1.40	0.6-2	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28			
	27-60	18-35	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.37	.43			
49:												
Temvik	0-7	18-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-6.0	.32	.32	5	6	48
	7-24	18-30	1.10-1.50	0.6-2	0.20-0.22	0.0-2.9	0.5-2.0	.43	.43			
	24-44	18-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.0	.43	.43			
	44-60	18-35	1.35-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.0-1.0	.43	.43			
Williams	0-6	18-27	1.15-1.30	0.6-2	0.19-0.22	0.0-2.9	2.0-7.0	.32	.32	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
49B:												
Temvik	0-7	18-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-6.0	.32	.32	5	6	48
	7-24	18-30	1.10-1.50	0.6-2	0.20-0.22	0.0-2.9	0.5-2.0	.43	.43			
	24-44	18-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.0	.43	.43			
	44-60	18-35	1.35-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.0-1.0	.43	.43			
Williams	0-6	18-27	1.15-1.30	0.6-2	0.19-0.22	0.0-2.9	2.0-7.0	.32	.32	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
50B:												
Temvik	0-7	18-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-6.0	.32	.32	5	6	48
	7-24	18-30	1.10-1.50	0.6-2	0.20-0.22	0.0-2.9	0.5-2.0	.43	.43			
	24-44	18-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.0	.43	.43			
	44-60	18-35	1.35-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.0-1.0	.43	.43			
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
51B:												
Amor	0-8	15-25	1.20-1.35	0.6-2	0.18-0.20	0.0-2.9	2.0-4.0	.24	.24	3	6	48
	8-19	18-30	1.20-1.40	0.6-2	0.17-0.19	0.0-2.9	1.0-3.0	.32	.32			
	19-31	18-30	1.20-1.60	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.32	.32			
	31-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Shambo	0-9	18-27	1.10-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	9-13	18-30	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	1.0-3.0	.28	.28			
	13-29	18-30	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	1.0-2.0	.28	.28			
	29-48	18-30	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.32	.32			
	48-60	18-35	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	0.0-1.0	.32	.32			
51C:												
Amor	0-8	15-25	1.20-1.35	0.6-2	0.18-0.20	0.0-2.9	2.0-4.0	.24	.24	3	6	48
	8-19	18-30	1.20-1.40	0.6-2	0.17-0.19	0.0-2.9	1.0-3.0	.32	.32			
	19-31	18-30	1.20-1.60	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.32	.32			
	31-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.2	.43	.43			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
51D:												
Amor	0-8	15-25	1.20-1.35	0.6-2	0.18-0.20	0.0-2.9	2.0-4.0	.24	.24	3	6	48
	8-19	18-30	1.20-1.40	0.6-2	0.17-0.19	0.0-2.9	1.0-3.0	.32	.32			
	19-31	18-30	1.20-1.60	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.32	.32			
	31-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.2	.43	.43			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
52B:												
Reeder	0-8	18-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28	3	6	48
	8-17	18-35	1.20-1.40	0.6-2	0.15-0.19	3.0-5.9	1.0-3.0	.28	.28			
	17-36	18-35	1.20-1.50	0.6-2	0.14-0.19	3.0-5.9	0.5-2.0	.32	.32			
	36-60	5-35	1.40-1.70	0.06-2	0.02-0.10	---	0.0-0.2	.43	.43			
Farnuf	0-9	18-27	1.20-1.40	0.6-2	0.18-0.20	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	9-23	25-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.28			
	23-34	18-35	1.20-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32			
	34-60	15-35	1.25-1.45	0.6-2	0.15-0.20	3.0-5.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
52C:												
Reeder	0-8	18-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28	3	6	48
	8-17	18-35	1.20-1.40	0.6-2	0.15-0.19	3.0-5.9	1.0-3.0	.28	.28			
	17-36	18-35	1.20-1.50	0.6-2	0.14-0.19	3.0-5.9	0.5-2.0	.32	.32			
	36-60	5-35	1.40-1.70	0.06-2	0.02-0.10	---	0.0-0.2	.43	.43			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
53B:												
Chama	0-4	15-27	1.10-1.35	0.6-2	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	3	4L	86
	4-8	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	1.0-3.0	.32	.32			
	8-34	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	0.5-1.0	.43	.43			
	34-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
Sen	0-6	18-27	1.10-1.30	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	6-17	18-35	1.20-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-3.0	.43	.43			
	17-34	18-30	1.30-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-2.0	.43	.43			
	34-60	15-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
53C:												
Chama	0-4	15-27	1.10-1.35	0.6-2	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	3	4L	86
	4-8	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	1.0-3.0	.32	.32			
	8-34	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	0.5-1.0	.43	.43			
	34-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Sen	0-6	18-27	1.10-1.30	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	6-17	18-35	1.20-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-3.0	.43	.43			
	17-34	18-30	1.30-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-2.0	.43	.43			
	34-60	15-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
53D:												
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
53D:(cont.)												
Chama	0-4	15-27	1.10-1.35	0.6-2	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	3	4L	86
	4-8	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	1.0-3.0	.32	.32			
	8-34	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	0.5-1.0	.43	.43			
	34-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
Sen	0-6	18-27	1.10-1.30	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	6-17	18-35	1.20-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-3.0	.43	.43			
	17-34	18-30	1.30-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-2.0	.43	.43			
	34-60	15-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
54F:												
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Sen	0-6	18-27	1.10-1.30	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	6-17	18-35	1.20-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-3.0	.43	.43			
	17-34	18-30	1.30-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-2.0	.43	.43			
	34-60	15-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
Chama	0-4	15-27	1.10-1.35	0.6-2	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	3	4L	86
	4-8	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	1.0-3.0	.32	.32			
	8-34	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	0.5-1.0	.43	.43			
	34-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
55B:												
Sen	0-6	18-27	1.10-1.30	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	6-17	18-35	1.20-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-3.0	.43	.43			
	17-34	18-30	1.30-1.50	0.6-2	0.16-0.22	0.0-5.9	1.0-2.0	.43	.43			
	34-60	15-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
Janesburg	0-8	18-27	1.00-1.20	0.2-0.6	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	8-10	15-27	1.20-1.40	0.2-2	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
56B:												
Lefor	0-7	10-25	1.10-1.30	2-6	0.16-0.18	0.0-2.9	2.0-4.0	.20	.20	3	3	86
	7-15	10-25	1.25-1.40	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32			
	15-30	18-27	1.20-1.50	0.6-2	0.15-0.17	0.0-2.9	0.5-1.0	.32	.32			
	30-36	10-25	1.20-1.50	0.6-2	0.15-0.17	0.0-2.9	0.0-0.5	.24	.24			
	36-60	1-10	1.45-1.70	0.01-0.3	0.02-0.04	---	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
56C:												
Lefor	0-7	10-25	1.10-1.30	2-6	0.16-0.18	0.0-2.9	2.0-4.0	.20	.20	3	3	86
	7-15	10-25	1.25-1.40	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32			
	15-30	18-27	1.20-1.50	0.6-2	0.15-0.17	0.0-2.9	0.5-1.0	.32	.32			
	30-36	10-25	1.20-1.50	0.6-2	0.15-0.17	0.0-2.9	0.0-0.5	.24	.24			
	36-60	1-10	1.45-1.70	0.01-0.3	0.02-0.04	---	0.0-0.5	.32	.32			
61D:												
Beisigl	0-5	3-10	1.20-1.50	6-20	0.11-0.13	0.0-2.9	1.0-3.0	.17	.17	3	2	134
	5-27	1-10	1.30-1.70	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.20			
	27-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Flasher	0-6	3-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	6-10	1-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	10-60	1-10	1.45-1.70	0.01-2	0.04-0.08	---	0.0-0.5	.32	.32			
61F:												
Beisigl	0-5	3-10	1.20-1.50	6-20	0.11-0.13	0.0-2.9	1.0-3.0	.17	.17	3	2	134
	5-27	1-10	1.30-1.70	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.20			
	27-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Flasher	0-6	3-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	6-10	1-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	10-60	1-10	1.45-1.70	0.01-2	0.04-0.08	---	0.0-0.5	.32	.32			
Tally	0-6	5-20	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	6-32	5-18	1.30-1.60	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.20	.20			
	32-60	5-18	1.30-1.60	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
62F:												
Flasher	0-6	3-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	6-10	1-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	10-60	1-10	1.45-1.70	0.01-2	0.04-0.08	---	0.0-0.5	.32	.32			
Rock outcrop	---	---	---	---	---	---	---	---	---	1	8	0
Vebar	0-5	10-18	1.20-1.50	2-6	0.15-0.17	0.0-2.9	1.0-4.0	.20	.20	3	3	86
	5-26	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20			
	26-32	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	0.0-1.0	.20	.20			
	32-60	1-10	1.45-1.70	0.06-2	0.04-0.08	---	0.0-0.5	.32	.32			
63B:												
Vebar	0-5	10-18	1.20-1.50	2-6	0.15-0.17	0.0-2.9	1.0-4.0	.20	.20	3	3	86
	5-26	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20			
	26-32	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	0.0-1.0	.20	.20			
	32-60	1-10	1.45-1.70	0.06-2	0.04-0.08	---	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
63B:(cont.)												
Flasher	0-6	3-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	6-10	1-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	10-60	1-10	1.45-1.70	0.01-2	0.04-0.08	---	0.0-0.5	.32	.32			
63C:												
Vebar	0-5	10-18	1.20-1.50	2-6	0.15-0.17	0.0-2.9	1.0-4.0	.20	.20	3	3	86
	5-26	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20			
	26-32	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	0.0-1.0	.20	.20			
	32-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Flasher	0-6	3-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	6-10	1-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	10-60	1-10	1.45-1.70	0.01-2	0.04-0.08	---	0.0-0.5	.32	.32			
63D:												
Vebar	0-5	10-18	1.20-1.50	2-6	0.15-0.17	0.0-2.9	1.0-4.0	.20	.20	3	3	86
	5-26	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20			
	26-32	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	0.0-1.0	.20	.20			
	32-60	1-10	1.45-1.70	0.06-2	0.04-0.08	---	0.0-0.5	.32	.32			
Flasher	0-6	3-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	6-10	1-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	10-60	1-10	1.45-1.70	0.01-2	0.04-0.08	---	0.0-0.5	.32	.32			
Tally	0-6	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	6-32	10-18	1.30-1.60	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.20	.20			
	32-60	5-18	1.30-1.60	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
66B:												
Manning	0-5	10-18	1.10-1.30	2-6	0.13-0.18	0.0-2.9	2.0-5.0	.20	.20	4	3	86
	5-18	10-20	1.20-1.50	2-6	0.13-0.19	0.0-2.9	1.0-3.0	.20	.24			
	18-25	10-20	1.30-1.50	2-6	0.12-0.20	0.0-2.9	1.0-2.0	.10	.20			
	25-60	1-10	1.20-1.70	20-60	0.02-0.08	0.0-2.9	0.0-1.0	.10	.20			
70B:												
Regent	0-10	27-40	1.10-1.30	0.2-0.6	0.17-0.20	3.0-5.9	1.0-5.0	.32	.32	3	7	38
	10-26	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	26-39	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.43	.43			
	39-60	10-90	1.40-1.65	0.001-0.6	0.06-0.12	---	0.0-0.5	.43	.43			
Savage	0-7	27-40	1.15-1.35	0.2-0.6	0.18-0.23	3.0-5.9	1.0-5.0	.32	.32	5	7	38
	7-25	35-50	1.25-1.50	0.06-0.6	0.17-0.20	6.0-8.9	1.0-2.0	.32	.32			
	25-51	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	51-60	35-45	1.30-1.50	0.06-0.6	0.17-0.20	6.0-8.9	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
70C:												
Regent	0-10	27-40	1.10-1.30	0.2-0.6	0.17-0.20	3.0-5.9	1.0-5.0	.32	.32	3	7	38
	10-26	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	26-39	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.43	.43			
	39-60	10-90	1.40-1.65	0.001-0.6	0.06-0.12	---	0.0-0.5	.43	.43			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
71B:												
Regent	0-10	27-40	1.10-1.30	0.2-0.6	0.17-0.20	3.0-5.9	1.0-5.0	.32	.32	3	7	38
	10-26	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	26-39	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.43	.43			
	39-60	10-90	1.40-1.65	0.001-0.6	0.06-0.12	---	0.0-0.5	.43	.43			
Janesburg	0-8	18-27	1.00-1.20	0.2-0.6	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	8-10	10-27	1.20-1.40	0.2-2	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
71C:												
Regent	0-10	27-40	1.10-1.30	0.2-0.6	0.17-0.20	3.0-5.9	1.0-5.0	.32	.32	3	7	38
	10-26	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.32	.32			
	26-39	35-50	1.30-1.50	0.06-0.2	0.17-0.20	6.0-8.9	0.5-1.0	.43	.43			
	39-60	10-90	1.40-1.65	0.001-0.6	0.06-0.12	---	0.0-0.5	.43	.43			
Janesburg	0-8	18-27	1.00-1.20	0.2-0.6	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	8-10	10-27	1.20-1.40	0.2-2	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
72B:												
Moreau	0-6	40-50	1.10-1.30	0.06-0.2	0.15-0.18	6.0-8.9	1.0-4.0	.28	.28	3	4L	86
	6-13	35-60	1.25-1.60	0.06-0.2	0.14-0.17	6.0-8.9	1.0-3.0	.32	.32			
	13-35	35-60	1.25-1.60	0.06-0.2	0.13-0.15	6.0-8.9	0.0-1.0	.43	.43			
	35-60	30-90	1.40-1.65	0.001-0.2	0.04-0.08	---	0.0-0.5	.43	.43			
72C:												
Moreau	0-6	40-50	1.10-1.30	0.06-0.2	0.15-0.18	6.0-8.9	1.0-4.0	.28	.28	3	4L	86
	6-13	35-60	1.25-1.60	0.06-0.2	0.14-0.17	6.0-8.9	1.0-3.0	.32	.32			
	13-35	35-60	1.25-1.60	0.06-0.2	0.13-0.15	6.0-8.9	0.0-1.0	.43	.43			
	35-60	30-90	1.40-1.65	0.001-0.2	0.04-0.08	---	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
72C:(cont.)												
Wayden	0-3	40-50	1.10-1.50	0.06-0.2	0.15-0.18	6.0-8.9	0.5-2.0	.28	.28	2	4	86
	3-15	35-50	1.10-1.50	0.06-0.2	0.14-0.19	6.0-8.9	0.5-1.0	.32	.32			
	15-60	30-90	1.40-1.65	0.001-0.2	0.04-0.08	---	0.0-0.5	.43	.43			
72D:												
Moreau	0-6	40-50	1.10-1.30	0.06-0.2	0.15-0.18	6.0-8.9	1.0-4.0	.28	.28	3	4L	86
	6-13	35-60	1.25-1.60	0.06-0.2	0.14-0.17	6.0-8.9	1.0-3.0	.32	.32			
	13-35	35-60	1.25-1.60	0.06-0.2	0.13-0.15	6.0-8.9	0.0-1.0	.43	.43			
	35-60	30-90	1.40-1.65	0.001-0.2	0.04-0.08	---	0.0-0.5	.43	.43			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
80:												
Badland, high precipitation	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
83F:												
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.43	.43			
Badland, outcrop	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
84F:												
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Chama	0-4	15-27	1.10-1.35	0.6-2	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	3	4L	86
	4-8	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	1.0-3.0	.32	.32			
	8-34	18-35	1.20-1.50	0.6-2	0.18-0.20	0.0-5.9	0.5-1.0	.43	.43			
	34-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.49	.49			
Havrelon	0-13	18-27	1.10-1.50	0.6-2	0.20-0.24	3.0-5.9	0.5-1.0	.32	.32	5	4L	86
	13-60	15-35	1.30-1.70	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			
88D:												
Brandenburg	0-4	10-25	1.20-1.40	0.6-2	0.12-0.16	0.0-2.9	2.0-3.0	.24	.49	2	7	38
	4-10	5-25	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.0-1.0	.24	.49			
	10-60	1-5	1.00-1.30	20-60	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
88D:(cont.)												
Searing	0-8	18-27	1.20-1.40	0.6-2	0.20-0.23	0.0-2.9	3.0-7.0	.28	.28	3	6	48
	8-23	18-27	1.20-1.40	0.6-2	0.17-0.20	0.0-2.9	2.0-4.0	.28	.28			
	23-33	18-27	1.20-1.40	0.6-6	0.16-0.18	0.0-2.9	0.5-2.0	.28	.55			
	33-60	1-5	1.00-1.30	20-60	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
Dogtooth	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	2-8	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	8-13	35-50	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	0.5-2.0	.32	.32			
	13-21	18-50	1.20-1.50	0.001-0.6	0.10-0.16	6.0-8.9	0.5-1.0	.32	.32			
	21-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
88F:												
Brandenburg	0-4	10-25	1.20-1.40	0.6-2	0.12-0.16	0.0-2.9	2.0-3.0	.24	.49	2	7	38
	4-10	5-25	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.0-1.0	.24	.49			
	10-60	1-5	1.00-1.30	20-60	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Dogtooth	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	2-8	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	8-13	35-50	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	0.5-2.0	.32	.32			
	13-21	18-50	1.20-1.50	0.001-0.6	0.10-0.16	6.0-8.9	0.5-1.0	.32	.32			
	21-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
89F:												
Brandenburg	0-4	10-25	1.20-1.40	0.6-2	0.18-0.20	0.0-2.9	2.0-3.0	.24	.49	2	7	38
	4-10	5-25	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.0-1.0	.24	.49			
	10-60	0-5	1.00-1.30	20-60	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Badland, outcrop	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
90E:												
Manning	0-5	10-18	1.10-1.30	2-6	0.13-0.18	0.0-2.9	2.0-5.0	.20	.20	4	3	86
	5-18	10-20	1.20-1.50	2-6	0.13-0.19	0.0-2.9	1.0-3.0	.20	.24			
	18-25	10-20	1.30-1.50	2-6	0.12-0.20	0.0-2.9	1.0-2.0	.10	.20			
	25-60	1-10	1.20-1.70	20-60	0.02-0.08	0.0-2.9	0.0-1.0	.10	.20			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
90E:(cont.)												
Schaller	0-9	10-18	1.10-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	9-15	5-18	1.10-1.50	2-6	0.02-0.04	0.0-2.9	0.0-2.0	.20	.20			
	15-60	1-10	1.10-1.50	6-20	0.02-0.04	0.0-2.9	0.0-0.5	.20	.20			
Wabek	0-5	15-27	1.10-1.50	2-6	0.20-0.22	0.0-2.9	1.0-2.0	.20	.28	2	5	56
	5-9	10-25	1.20-1.60	2-20	0.11-0.15	0.0-2.9	0.0-1.0	.10	.17			
	9-60	1-10	1.30-1.70	20-60	0.02-0.04	0.0-2.9	0.0-1.0	.10	.10			
91F:												
Wabek	0-5	15-27	1.10-1.50	2-6	0.13-0.19	0.0-2.9	1.0-2.0	.10	.28	2	5	56
	5-9	10-25	1.20-1.60	2-20	0.11-0.15	0.0-2.9	0.0-1.0	.10	.17			
	9-60	1-10	1.30-1.70	20-60	0.02-0.04	0.0-2.9	0.0-1.0	.10	.10			
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
93B:												
Lehr	0-6	18-27	1.10-1.40	0.6-6	0.17-0.22	0.0-2.9	1.0-3.0	.28	.28	3	5	56
	6-11	18-30	1.20-1.50	0.6-6	0.17-0.20	3.0-5.9	1.0-2.0	.20	.28			
	11-15	18-27	1.20-1.50	0.6-6	0.17-0.20	3.0-5.9	1.0-2.0	.20	.28			
	15-22	5-18	1.40-1.70	6-60	0.09-0.11	0.0-2.9	0.0-1.0	.10	.17			
	22-60	1-10	1.40-1.70	6-60	0.02-0.04	0.0-2.9	0.0-1.0	.10	.17			
Stady	0-6	18-27	1.10-1.30	0.6-2	0.17-0.20	0.0-2.9	2.0-4.0	.28	.28	4	5	56
	6-15	18-27	1.10-1.30	0.6-2	0.17-0.19	0.0-2.9	1.0-3.0	.28	.28			
	15-29	18-27	1.10-1.40	0.6-2	0.17-0.19	0.0-2.9	0.0-1.0	.24	.32			
	29-60	1-10	1.30-1.70	20-60	0.02-0.04	0.0-2.9	0.0-0.5	.10	.17			
94B:												
Searing	0-8	18-27	1.20-1.40	0.6-2	0.20-0.23	0.0-2.9	3.0-7.0	.28	.28	3	6	48
	8-23	18-27	1.20-1.40	0.6-2	0.17-0.20	0.0-2.9	2.0-4.0	.28	.28			
	23-33	18-27	1.20-1.40	0.6-6	0.16-0.18	0.0-2.9	0.5-2.0	.28	.55			
	33-60	1-5	1.00-1.30	20-60	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
Ringling	0-5	18-27	1.10-1.30	0.6-2	0.16-0.20	0.0-2.9	2.0-5.0	.17	.17	2	5	56
	5-17	18-27	1.25-1.50	2-6	0.06-0.07	0.0-2.9	1.0-2.0	.10	.32			
	17-42	1-5	1.30-1.50	6-20	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
	42-60	1-5	1.30-1.50	6-20	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
95:												
Havrelon	0-13	40-50	1.10-1.30	0.06-0.6	0.14-0.17	6.0-8.9	0.5-3.0	.28	.28	5	4L	86
	13-60	15-35	1.30-1.70	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
96:												
Pits, gravel and sand-	0-6	1-10	1.40-1.60	6-60	0.01-0.04	0.0-2.9	0.5-1.0	.10	.20	1	8	0
	6-60	1-15	1.40-1.70	6-60	0.01-0.04	0.0-2.9	0.0-0.5	.10	.17			
98F:												
Tinsley----------	0-3	5-15	1.30-1.50	2-6	0.08-0.11	0.0-2.9	0.7-2.0	.10	.20	2	3	86
	3-60	0-10	1.45-1.65	6-20	0.01-0.02	0.0-2.9	0.0-0.5	.05	.17			
Chanta----------	0-6	18-27	1.20-1.40	0.6-2	0.18-0.21	0.0-2.9	2.0-4.0	.28	.32	4	6	48
	6-22	18-30	1.20-1.40	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.28	.32			
	22-26	10-20	1.30-1.50	0.6-6	0.14-0.18	0.0-2.9	1.0-2.0	.28	.32			
	26-60	1-10	1.40-1.70	6-20	0.03-0.05	0.0-2.9	0.5-1.0	.10	.17			
99:												
Mckeen----------	0-2	18-27	1.10-1.35	0.6-6	0.15-0.24	0.0-2.9	0.5-1.0	.28	.28	5	4L	86
	2-12	18-27	1.30-1.65	0.6-6	0.15-0.24	0.0-2.9	0.5-1.0	.28	.28			
	12-15	20-50	1.20-1.57	0.06-2	0.14-0.19	3.0-5.9	0.5-1.0	.28	.28			
	15-60	5-50	1.30-1.65	0.06-6	0.13-0.24	3.0-5.9	0.0-0.5	.28	.28			
100F:												
Boxwell----------	0-5	18-27	1.20-1.40	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	3	6	48
	5-14	18-30	1.30-1.50	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32			
	14-28	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-1.0	.37	.37			
	28-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Cabbart----------	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Arikara----------	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
101F:												
Cabbart----------	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Badland, outcrop------	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
102B:												
Kremlin----------	0-11	18-27	1.15-1.35	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-19	18-30	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
	19-60	18-30	1.30-1.55	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
102B:(cont.)												
Ethridge	0-3	18-27	1.10-1.30	0.6-2	0.20-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	3-10	35-50	1.30-1.50	0.06-0.2	0.15-0.19	6.0-8.9	1.0-2.0	.32	.32			
	10-23	35-50	1.30-1.50	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.37	.37			
	23-38	27-45	1.30-1.50	0.06-0.2	0.14-0.18	6.0-8.9	0.5-1.0	.37	.37			
	38-60	20-35	1.30-1.50	0.06-0.2	0.14-0.18	3.0-5.9	0.0-0.5	.37	.37			
Gerda	0-2	18-27	1.10-1.30	0.2-0.6	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-11	35-55	1.20-1.40	0.001-0.2	0.10-0.12	6.0-8.9	2.0-4.0	.32	.32			
	11-19	35-55	1.15-1.45	0.001-0.2	0.10-0.12	6.0-8.9	1.0-2.0	.32	.32			
	19-29	30-45	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	1.0-2.0	.43	.43			
	29-44	30-50	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32			
	44-80	15-27	1.30-1.50	0.2-6	0.09-0.11	0.0-2.9	0.5-1.0	.43	.43			
103B:												
Chinook	0-6	10-18	1.25-1.30	2-6	0.11-0.17	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	6-15	10-18	1.30-1.40	2-6	0.09-0.15	0.0-2.9	0.5-1.0	.24	.24			
	15-40	10-18	1.40-1.60	2-6	0.09-0.15	0.0-2.9	0.5-1.0	.24	.24			
	40-66	5-18	1.35-1.55	2-20	0.08-0.15	0.0-2.9	0.0-0.5	.24	.24			
Rhame	0-8	10-18	1.10-1.50	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	8-26	10-18	1.10-1.50	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	26-34	10-18	1.10-1.50	2-6	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	34-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
103D:												
Rhame	0-8	10-18	1.10-1.50	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	8-26	10-18	1.10-1.50	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	26-34	10-18	1.10-1.50	2-6	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	34-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Chinook	0-6	10-18	1.25-1.30	2-6	0.11-0.17	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	6-15	10-18	1.30-1.40	2-6	0.09-0.15	0.0-2.9	0.5-1.0	.24	.24			
	15-40	10-18	1.40-1.60	2-6	0.09-0.15	0.0-2.9	0.5-1.0	.24	.24			
	40-66	5-18	1.35-1.55	2-20	0.08-0.15	0.0-2.9	0.0-0.5	.24	.24			
103F:												
Rhame	0-8	10-18	1.10-1.50	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	8-26	10-18	1.10-1.50	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	26-34	10-18	1.10-1.50	2-6	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	34-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Fleak	0-3	3-10	1.10-1.50	6-20	0.06-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	3-17	1-10	1.10-1.50	6-20	0.06-0.10	0.0-2.9	0.0-0.5	.17	.17			
	17-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
104E:												
Badland, outcrop------	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Patent----------	0-7	18-27	1.10-1.40	0.6-2	0.16-0.22	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	7-60	15-35	1.20-1.60	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
105:												
Havre----------	0-10	18-27	1.15-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.37	.37	5	4L	86
	10-60	18-35	1.35-1.55	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.28	.28			
106:												
Glendive----------	0-5	10-18	1.40-1.60	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	5-16	8-18	1.30-1.50	2-6	0.15-0.19	0.0-2.9	0.5-1.0	.32	.32			
	16-60	5-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20			
107:												
Kremlin----------	0-11	18-27	1.15-1.35	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-19	18-30	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
	19-60	18-30	1.30-1.55	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
108B:												
Hanly----------	0-5	10-18	1.10-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	5-60	1-10	1.20-1.60	6-20	0.05-0.14	0.0-2.9	0.0-0.5	.17	.17			
109:												
Havre, wooded---------	0-10	18-27	1.15-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.37	.37	5	4L	86
	10-60	18-35	1.35-1.55	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.28	.28			
110B:												
Maltese----------	0-7	18-27	1.00-1.20	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	7-10	18-27	1.20-1.40	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.37	.37			
	10-16	40-60	1.20-1.40	0.001-0.2	0.12-0.14	6.0-8.9	1.0-3.0	.37	.37			
	16-20	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	20-33	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	33-60	15-40	1.30-1.45	0.2-6	0.12-0.14	3.0-5.9	0.5-1.0	.37	.37			
Gerda----------	0-2	18-27	1.10-1.30	0.2-0.6	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-11	35-55	1.20-1.40	0.001-0.2	0.10-0.12	6.0-8.9	2.0-4.0	.32	.32			
	11-19	35-55	1.25-1.50	0.001-0.2	0.10-0.12	6.0-8.9	1.0-2.0	.32	.32			
	19-29	30-45	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	1.0-2.0	.43	.43			
	29-44	30-50	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32			
	44-80	15-27	1.30-1.50	0.2-6	0.09-0.11	0.0-2.9	0.5-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
111D:												
Gerda	0-2	18-27	1.10-1.30	0.2-0.6	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-11	35-55	1.20-1.40	0.001-0.2	0.10-0.12	6.0-8.9	2.0-4.0	.32	.32			
	11-19	35-55	1.15-1.45	0.001-0.2	0.10-0.12	6.0-8.9	1.0-2.0	.32	.32			
	19-29	30-45	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	1.0-2.0	.43	.43			
	29-44	30-50	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32			
	44-80	15-27	1.30-1.50	0.2-6	0.09-0.11	0.0-2.9	0.5-1.0	.43	.43			
Kirby	0-4	10-22	1.30-1.60	2-6	0.07-0.14	0.0-2.9	1.0-2.0	.10	.32	2	5	56
	4-12	10-22	1.45-1.65	6-20	0.05-0.06	0.0-2.9	0.5-1.0	.05	.28			
	12-60	1-5	1.60-1.80	6-20	0.00-0.01	0.0-2.9	0.0-0.5	.02	.32			
111F:												
Kirby	0-4	10-22	1.30-1.60	2-6	0.07-0.14	0.0-2.9	1.0-2.0	.10	.32	2	5	56
	4-12	10-22	1.45-1.65	6-20	0.05-0.06	0.0-2.9	0.5-1.0	.05	.28			
	12-60	1-5	1.60-1.80	6-20	0.00-0.01	0.0-2.9	0.0-0.5	.02	.32			
Scairt	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-6	35-55	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	2.0-4.0	.28	.28			
	6-13	35-55	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.43	.43			
	13-22	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.5-1.0	.43	.43			
	22-28	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.0-0.5	.43	.43			
	28-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
112F:												
Kirby	0-4	10-22	1.30-1.60	2-6	0.07-0.14	0.0-2.9	1.0-2.0	.10	.32	2	5	56
	4-12	10-22	1.45-1.65	6-20	0.05-0.06	0.0-2.9	0.5-1.0	.05	.28			
	12-60	1-5	1.60-1.80	6-20	0.00-0.01	0.0-2.9	0.0-0.5	.02	.32			
Badland, outcrop	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Patent	0-7	18-27	1.10-1.40	0.6-2	0.16-0.22	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	7-60	15-35	1.20-1.60	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
113F:												
Lonna	0-2	18-27	1.10-1.30	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	2-11	18-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	11-34	18-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-35	1.25-1.50	0.6-2	0.12-0.16	3.0-5.9	0.0-0.5	.37	.37			
Cabbart	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
114:												
Channel	---	---	---	---	---	---	---	---	---	-	---	---
Glendive	0-5	10-18	1.40-1.60	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	5-16	8-18	1.30-1.50	2-6	0.15-0.19	0.0-2.9	0.5-1.0	.32	.32			
	16-60	5-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20			
Havre	0-10	18-27	1.15-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.37	.37	5	4L	86
	10-60	18-35	1.35-1.55	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.28	.28			
115F:												
Badland, outcrop	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
Cabbart	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
116F:												
Kremlin	0-11	18-27	1.15-1.35	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-19	18-30	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
	19-60	18-30	1.30-1.55	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
Cabbart	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
117:												
Wolf Point	0-1	27-40	1.20-1.40	0.06-0.2	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37	5	7	38
	1-10	35-50	1.20-1.40	0.06-0.2	0.15-0.18	6.0-8.9	0.5-1.0	.37	.37			
	10-60	30-60	1.20-1.40	0.06-0.2	0.14-0.20	6.0-8.9	0.0-0.5	.37	.37			
118F:												
Lonna	0-2	18-27	1.10-1.30	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	2-11	18-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	11-34	18-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-35	1.25-1.50	0.6-2	0.12-0.16	3.0-5.9	0.0-0.5	.37	.37			
Kirby	0-4	10-22	1.30-1.60	2-6	0.07-0.14	0.0-2.9	1.0-2.0	.10	.32	2	5	56
	4-12	10-22	1.45-1.65	6-20	0.05-0.06	0.0-2.9	0.5-1.0	.05	.28			
	12-60	1-5	1.60-1.80	6-20	0.00-0.01	0.0-2.9	0.0-0.5	.02	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
118F:(cont.)												
Cabbart	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
119F:												
Patent	0-7	18-27	1.10-1.40	0.6-2	0.16-0.22	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	7-60	15-35	1.20-1.60	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
Badland, outcrop	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Cabbart	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
121F:												
Maltese	0-7	18-27	1.00-1.20	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	7-10	18-27	1.20-1.40	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.37	.37			
	10-16	40-60	1.20-1.40	0.001-0.2	0.12-0.14	6.0-8.9	1.0-3.0	.37	.37			
	16-20	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	20-33	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	33-60	15-40	1.30-1.45	0.2-6	0.12-0.14	3.0-5.9	0.5-1.0	.37	.37			
Lonna	0-2	18-27	1.10-1.30	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	2-11	18-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	11-34	18-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-35	1.25-1.50	0.6-2	0.12-0.16	3.0-5.9	0.0-0.5	.37	.37			
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
127:												
Maschetah	0-7	20-27	1.10-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-4.0	.32	.32	5	4L	86
	7-48	20-35	1.20-1.40	0.2-0.6	0.18-0.20	3.0-5.9	0.5-3.0	.37	.37			
	48-80	20-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37			
127B:												
Maschetah	0-7	20-27	1.10-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-4.0	.32	.32	5	4L	86
	7-48	20-35	1.20-1.40	0.2-0.6	0.18-0.20	3.0-5.9	0.5-3.0	.37	.37			
	48-80	20-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
127C:												
Maschetah	0-7	20-27	1.10-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-4.0	.32	.32	5	4L	86
	7-48	20-35	1.20-1.40	0.2-0.6	0.18-0.20	3.0-5.9	0.5-3.0	.37	.37			
	48-80	20-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37			
131B:												
Lonna	0-2	18-27	1.10-1.30	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	2-11	18-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	11-34	18-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-35	1.25-1.50	0.6-2	0.12-0.16	3.0-5.9	0.0-0.5	.37	.37			
131C:												
Lonna	0-2	18-27	1.10-1.30	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	2-11	18-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	11-34	18-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-35	1.25-1.50	0.6-2	0.12-0.16	3.0-5.9	0.0-0.5	.37	.37			
132C:												
Patent	0-7	18-27	1.10-1.40	0.6-2	0.16-0.22	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	7-60	15-35	1.20-1.60	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
Gerda	0-2	18-27	1.10-1.30	0.2-0.6	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-11	35-55	1.20-1.40	0.001-0.2	0.10-0.12	6.0-8.9	2.0-4.0	.32	.32			
	11-19	35-55	1.15-1.45	0.001-0.2	0.10-0.12	6.0-8.9	1.0-2.0	.32	.32			
	19-29	30-45	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	1.0-2.0	.43	.43			
	29-44	30-50	1.30-1.50	0.2-2	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32			
	44-80	15-27	1.30-1.50	0.2-6	0.09-0.11	0.0-2.9	0.5-1.0	.43	.43			
Slickspots	0-1	40-60	1.30-1.50	0.06-0.2	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32	1	4L	86
	1-60	18-50	1.20-1.60	0.06-2	0.10-0.12	3.0-8.9	0.0-0.5	.32	.32			
138E:												
Scairt	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-6	35-55	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	2.0-4.0	.28	.28			
	6-13	35-55	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.43	.43			
	13-22	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.5-1.0	.43	.43			
	22-28	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.0-0.5	.43	.43			
	28-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Maltese	0-7	18-27	1.00-1.20	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	7-10	18-27	1.20-1.40	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.37	.37			
	10-16	40-60	1.20-1.40	0.001-0.2	0.12-0.14	6.0-8.9	1.0-3.0	.37	.37			
	16-20	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	20-33	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	33-60	15-40	1.30-1.45	0.2-6	0.12-0.14	3.0-5.9	0.5-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
138E:(cont.)												
Boxwell	0-5	18-27	1.20-1.40	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	3	6	48
	5-14	18-30	1.30-1.50	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32			
	14-28	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-1.0	.37	.37			
	28-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
145F:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
146B:												
Dooley	0-6	10-18	1.10-1.40	2-6	0.13-0.16	0.0-2.9	2.0-4.0	.24	.24	5	3	86
	6-15	20-35	1.20-1.60	0.6-2	0.13-0.17	3.0-5.9	0.0-2.0	.32	.32			
	15-24	15-25	1.20-1.60	2-6	0.13-0.16	0.0-2.9	0.0-1.0	.24	.24			
	24-60	25-45	1.20-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-0.5	.32	.32			
151B:												
Boxwell	0-5	18-27	1.20-1.40	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	3	6	48
	5-14	18-30	1.30-1.50	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32			
	14-28	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-1.0	.37	.37			
	28-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Kremlin	0-11	18-27	1.15-1.35	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-19	18-30	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
	19-60	18-30	1.30-1.55	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
151D:												
Boxwell	0-5	18-27	1.20-1.40	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	3	6	48
	5-14	18-30	1.30-1.50	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32			
	14-28	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-1.0	.37	.37			
	28-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Kremlin	0-11	18-27	1.15-1.35	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-19	18-30	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
	19-60	18-30	1.30-1.55	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
154F:												
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
Shambo	0-9	18-27	1.10-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	9-13	18-30	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	1.0-3.0	.28	.28			
	13-29	18-30	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	1.0-2.0	.28	.28			
	29-48	18-30	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.32	.32			
	48-60	18-35	1.20-1.50	0.6-2	0.17-0.19	0.0-2.9	0.0-1.0	.32	.32			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
161F:												
Beisigl	0-5	5-10	1.20-1.50	6-20	0.11-0.13	0.0-2.9	1.0-3.0	.17	.17	3	2	134
	5-27	1-8	1.30-1.70	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.20			
	27-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Flasher	0-6	0-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	6-10	0-10	1.10-1.50	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	10-60	1-10	1.45-1.70	0.6-2	0.02-0.04	---	0.0-0.5	.32	.32			
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-27	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	15-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-27	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
164D:												
Vebar, extremely stony	0-5	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-4.0	.20	.24	3	8	0
	5-26	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20			
	26-32	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	0.0-1.0	.20	.20			
	32-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
171:												
Lohler, moderately saline	0-8	40-60	1.10-1.40	0.001-0.2	0.07-0.14	6.0-8.9	0.5-3.0	.32	.32	5	4	86
	8-60	35-60	1.20-1.50	0.001-0.2	0.07-0.14	6.0-8.9	0.0-0.5	.28	.28			
180:												
Badland	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
183F:												
Badland, outcrop------	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Cabba-----------------	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.43	.43			
187F:												
Arikara----------------	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
Cabbart----------------	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
193B:												
Chanta-----------------	0-6	18-27	1.20-1.40	0.6-2	0.18-0.21	0.0-2.9	2.0-4.0	.28	.32	4	6	48
	6-22	18-30	1.20-1.40	0.6-2	0.18-0.21	3.0-5.9	1.0-3.0	.28	.32			
	22-26	10-20	1.30-1.50	0.6-6	0.14-0.18	0.0-2.9	1.0-2.0	.28	.32			
	26-60	1-10	1.40-1.70	6-20	0.03-0.05	0.0-2.9	0.5-1.0	.10	.17			
194F:												
Kirby------------------	0-4	10-22	1.30-1.60	2-6	0.07-0.14	0.0-2.9	1.0-2.0	.10	.32	2	5	56
	4-12	10-22	1.45-1.65	6-20	0.05-0.06	0.0-2.9	0.5-1.0	.05	.28			
	12-60	1-5	1.60-1.80	6-20	0.00-0.01	0.0-2.9	0.0-0.5	.02	.32			
Arikara----------------	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
Badland, outcrop------	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
195:												
Havrelon---------------	0-13	27-35	1.10-1.50	0.2-0.6	0.09-0.12	3.0-5.9	0.5-1.0	.37	.37	5	4L	86
	13-60	15-35	1.30-1.70	0.2-0.6	0.07-0.10	3.0-5.9	0.0-0.5	.32	.32			
199:												
Mckeen-----------------	0-2	18-27	1.10-1.35	0.6-6	0.15-0.24	0.0-2.9	0.5-1.0	.28	.28	5	4L	86
	2-12	18-27	1.30-1.65	0.6-6	0.15-0.24	0.0-2.9	0.5-1.0	.28	.28			
	12-15	20-50	1.20-1.57	0.06-2	0.14-0.19	3.0-5.9	0.5-1.0	.28	.28			
	15-60	5-50	1.30-1.65	0.06-6	0.13-0.24	3.0-5.9	0.0-0.5	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
201F:												
Badland, outcrop------	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Cabbart----------	0-3	18-27	1.00-1.20	0.6-2	0.17-0.21	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	3-18	18-35	1.10-1.30	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	18-60	10-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
202D:												
Boxwell----------	0-5	18-27	1.20-1.40	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	3	6	48
	5-14	18-30	1.30-1.50	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32			
	14-28	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-1.0	.37	.37			
	28-60	5-35	1.40-1.65	0.06-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Scairt----------	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-6	35-55	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	2.0-4.0	.28	.28			
	6-13	35-55	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.43	.43			
	13-22	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.5-1.0	.43	.43			
	22-28	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.0-0.5	.43	.43			
	28-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Maltese----------	0-7	18-27	1.00-1.20	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	7-10	18-27	1.20-1.40	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.37	.37			
	10-16	40-60	1.20-1.40	0.001-0.2	0.12-0.14	6.0-8.9	1.0-3.0	.37	.37			
	16-20	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	20-33	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	33-60	15-40	1.30-1.45	0.2-6	0.12-0.14	3.0-5.9	0.5-1.0	.37	.37			
203D:												
Rhame----------	0-8	10-18	1.10-1.50	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	8-26	10-18	1.10-1.50	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	26-34	10-18	1.10-1.50	2-6	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	34-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Kremlin----------	0-11	18-27	1.15-1.35	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-19	18-30	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
	19-60	18-30	1.30-1.55	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
Maltese----------	0-7	18-27	1.00-1.20	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	7-10	18-27	1.20-1.40	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.37	.37			
	10-16	40-60	1.20-1.40	0.001-0.2	0.12-0.14	6.0-8.9	1.0-3.0	.37	.37			
	16-20	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	20-33	35-50	1.30-1.45	0.001-0.2	0.12-0.14	6.0-8.9	1.0-2.0	.37	.37			
	33-60	15-40	1.30-1.45	0.2-6	0.12-0.14	3.0-5.9	0.5-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
203F:												
Rhame----------	0-8	8-18	1.10-1.50	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	8-26	8-18	1.10-1.50	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	26-34	8-18	1.10-1.50	2-6	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	34-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Scairt----------	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	2-6	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	2.0-4.0	.28	.28			
	6-13	35-50	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.43	.43			
	13-22	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.5-1.0	.43	.43			
	22-28	18-50	1.20-1.50	0.2-0.6	0.10-0.18	6.0-8.9	0.0-0.5	.43	.43			
	28-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
Kremlin----------	0-11	18-27	1.15-1.35	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-19	18-30	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
	19-60	18-30	1.30-1.55	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
205:												
Havre, rarely flooded-	0-10	18-27	1.15-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.37	.37	5	4L	86
	10-60	18-35	1.35-1.55	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.28	.28			
206:												
Glendive, rarely flooded----------	0-5	10-18	1.40-1.60	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	5-16	8-18	1.30-1.50	2-6	0.15-0.19	0.0-2.9	0.5-1.0	.32	.32			
	16-60	5-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20			
207:												
Harriet----------	0-2	12-27	1.10-1.40	0.2-2	0.20-0.24	0.0-2.9	3.0-6.0	.37	.37	2	6	48
	2-18	35-50	1.20-1.60	0.001-0.06	0.10-0.15	6.0-8.9	1.0-3.0	.37	.37			
	18-28	18-40	1.20-1.60	0.6-2	0.10-0.15	3.0-5.9	0.5-1.0	.37	.37			
	28-38	10-18	1.40-1.60	0.6-2	0.09-0.15	0.0-2.9	0.0-1.0	.37	.37			
	38-40	23-35	1.35-1.55	0.6-2	0.09-0.12	3.0-5.9	0.0-0.5	.32	.32			
	40-60	15-45	1.20-1.60	0.06-0.2	0.09-0.12	3.0-5.9	0.0-0.5	.32	.32			
211F:												
Cabba----------	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Badland, outcrop------	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Arikara----------	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
212:												
Trembles	0-9	10-18	1.20-1.55	0.6-6	0.16-0.18	0.0-2.9	0.5-3.0	.24	.24	5	3	86
	9-59	10-18	1.35-1.55	0.6-6	0.14-0.20	0.0-2.9	0.5-1.0	.20	.20			
	59-80	5-18	1.45-1.65	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
213:												
Havrelon, slightly wet	0-13	18-27	1.10-1.50	0.6-2	0.20-0.24	3.0-5.9	0.5-1.0	.32	.32	5	4L	86
	13-60	15-35	1.30-1.70	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			
214:												
Channel	---	---	---	---	---	---	---	---	---	-	---	---
Korchea, wooded	0-6	10-35	1.10-1.50	0.2-2	0.16-0.24	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	6-60	18-35	1.30-1.60	0.2-2	0.15-0.20	3.0-5.9	0.0-2.0	.28	.28			
217:												
Wolf Point, wooded	0-1	27-40	1.20-1.40	0.06-0.2	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37	5	7	38
	1-10	35-50	1.20-1.40	0.06-0.2	0.15-0.18	6.0-8.9	0.5-1.0	.37	.37			
	10-60	30-60	1.20-1.40	0.06-0.2	0.14-0.20	6.0-8.9	0.0-0.5	.37	.37			
218F:												
Cherry	0-3	18-27	1.10-1.50	0.6-2	0.20-0.24	0.1-2.9	0.5-3.0	.37	.37	5	4L	86
	3-33	18-35	1.20-1.60	0.06-0.6	0.16-0.22	3.0-5.9	0.5-2.0	.37	.37			
	33-60	18-50	1.40-1.70	0.06-0.6	0.13-0.22	3.0-5.9	0.0-1.0	.37	.37			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Brandenburg	0-4	10-25	1.20-1.40	0.6-2	0.12-0.16	0.0-2.9	2.0-3.0	.24	.49	2	7	38
	4-10	5-25	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.0-1.0	.24	.49			
	10-60	1-5	1.00-1.30	20-60	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
227:												
Haydraw	0-6	18-27	1.10-1.30	0.6-2	0.22-0.24	0.1-2.9	2.0-4.0	.32	.32	5	4L	86
	6-58	18-35	1.20-1.40	0.2-0.6	0.20-0.24	3.0-5.9	0.5-2.0	.43	.43			
	58-80	18-35	1.25-1.45	0.2-0.6	0.16-0.22	3.0-5.9	0.0-0.5	.43	.43			
227B:												
Haydraw	0-6	18-27	1.10-1.30	0.6-2	0.22-0.24	0.1-2.9	2.0-4.0	.32	.32	5	4L	86
	6-58	18-35	1.20-1.40	0.2-0.6	0.20-0.24	3.0-5.9	0.5-2.0	.43	.43			
	58-80	18-35	1.25-1.45	0.2-0.6	0.16-0.22	3.0-5.9	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
231C:												
Patent	0-7	18-27	1.10-1.40	0.6-2	0.16-0.22	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	7-60	15-35	1.20-1.60	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
Gullied land	0-60	10-40	1.20-1.50	0.6-6	0.10-0.20	3.0-5.9	0.0-0.5	.37	.37	1	4L	86
Glendive	0-5	10-18	1.40-1.60	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	5-16	8-18	1.30-1.50	2-6	0.15-0.19	0.0-2.9	0.5-1.0	.32	.32			
	16-60	5-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20			
232C:												
Lambert	0-5	18-27	1.10-1.30	0.6-2	0.18-0.22	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	5-36	18-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	36-60	15-35	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.0-0.5	.37	.37			
Slickspots	0-1	40-60	1.30-1.50	0.06-0.2	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32	1	6	48
	1-60	18-50	1.20-1.60	0.06-2	0.10-0.12	3.0-8.9	0.0-0.5	.32	.32			
Rhoades	0-3	18-27	1.10-1.30	0.2-2	0.13-0.15	0.0-2.9	2.0-4.0	.32	.32	2	6	48
	3-8	35-50	1.20-1.40	0.001-0.2	0.10-0.12	6.0-8.9	0.5-2.0	.28	.28			
	8-14	35-50	1.25-1.50	0.001-0.2	0.10-0.12	6.0-8.9	0.5-2.0	.32	.32			
	14-46	20-50	1.30-1.50	0.001-2	0.10-0.12	6.0-8.9	0.0-0.5	.32	.32			
	46-60	20-45	1.30-1.50	0.001-2	0.10-0.12	6.0-8.9	0.0-0.5	.32	.32			
238B:												
Janesburg	0-8	18-27	1.00-1.20	0.2-0.6	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	8-10	15-27	1.20-1.40	0.2-2	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.06-0.12	---	0.0-0.5	.43	.43			
Dogtooth	0-2	18-27	1.10-1.30	0.2-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	2-8	35-50	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	8-13	35-50	1.20-1.50	0.001-0.2	0.10-0.16	6.0-8.9	0.5-2.0	.32	.32			
	13-21	18-50	1.20-1.50	0.001-0.6	0.10-0.16	6.0-8.9	0.5-1.0	.32	.32			
	21-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
239D:												
Vebar	0-5	10-18	1.20-1.50	2-6	0.15-0.17	0.0-2.9	1.0-4.0	.20	.20	3	3	86
	5-26	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20			
	26-32	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	0.0-1.0	.20	.20			
	32-60	1-10	1.45-1.70	0.06-2	0.04-0.08	---	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
239D:(cont.)												
Janesburg	0-8	10-18	1.00-1.20	2-6	0.16-0.18	0.0-2.9	2.0-4.0	.20	.20	2	3	86
	8-10	8-18	1.20-1.40	0.6-6	0.16-0.24	0.0-2.9	2.0-3.0	.32	.32			
	10-21	35-55	1.20-1.40	0.001-0.2	0.10-0.16	6.0-8.9	1.0-2.0	.32	.32			
	21-26	18-45	1.20-1.50	0.06-2	0.10-0.16	6.0-8.9	0.5-1.0	.43	.43			
	26-60	10-90	1.20-1.50	0.001-0.6	0.04-0.10	---	0.0-0.5	.43	.43			
242F:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
287F:												
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
299:												
Minnewaukan	0-3	8-18	1.20-1.50	2-6	0.12-0.16	0.0-2.9	2.0-6.0	.20	.20	5	3	86
	3-5	1-10	1.40-1.60	6-20	0.04-0.10	0.0-2.9	2.0-6.0	.17	.17			
	5-60	1-10	1.40-1.70	6-20	0.04-0.12	0.0-2.9	0.0-1.0	.15	.15			
Banks	0-4	3-10	1.30-1.50	6-20	0.10-0.12	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	4-30	1-10	1.40-1.70	6-20	0.06-0.13	0.0-2.9	0.0-0.5	.17	.17			
	30-60	1-10	1.40-1.70	6-20	0.05-0.12	0.0-2.9	0.0-0.5	.17	.17			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
299:(cont.)												
Riverwash	0-6	1-5	1.40-1.70	6-20	0.03-0.04	0.0-2.9	0.0-0.5	.15	.15	5	1	180
	6-60	1-10	1.40-1.70	6-20	0.04-0.06	0.0-2.9	0.0-0.5	.15	.15			
317:												
Lallie	0-2	27-50	1.20-1.30	0.01-0.06	0.14-0.23	6.0-8.9	6.0-12	.28	.28	5	8	0
	2-24	27-45	1.20-1.40	0.06-0.2	0.14-0.23	6.0-8.9	1.0-3.0	.43	.43			
	24-32	27-50	1.20-1.30	0.01-0.06	0.14-0.23	6.0-8.9	2.0-4.0	.43	.43			
	32-60	27-50	1.20-1.50	0.01-0.06	0.13-0.23	6.0-8.9	0.0-1.0	.28	.28			
331B:												
Cherry	0-3	18-27	1.10-1.50	0.6-2	0.20-0.24	0.1-2.9	0.5-3.0	.37	.37	5	4L	86
	3-33	18-35	1.20-1.60	0.06-0.6	0.16-0.22	3.0-5.9	0.5-2.0	.37	.37			
	33-60	18-50	1.40-1.70	0.06-0.6	0.13-0.22	3.0-5.9	0.0-1.0	.37	.37			
Gullied land	0-60	10-40	1.20-1.50	0.6-6	0.10-0.20	3.0-5.9	0.0-0.5	.37	.37	1	4L	86
Havrelon	0-13	18-27	1.10-1.50	0.6-2	0.20-0.24	3.0-5.9	0.5-1.0	.32	.32	5	4L	86
	13-60	15-35	1.30-1.70	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			
340B:												
Niobell	0-6	10-27	1.10-1.30	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.32	.32	5	6	48
	6-9	10-27	1.10-1.30	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.32	.32			
	9-19	35-50	1.20-1.50	0.06-0.6	0.15-0.19	6.0-8.9	1.0-3.0	.32	.32			
	19-29	35-45	1.20-1.60	0.06-0.6	0.15-0.19	6.0-8.9	0.0-1.0	.37	.37			
	29-60	18-35	1.20-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.37	.37			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
341B:												
Noonan	0-6	18-27	1.10-1.40	0.6-2	0.20-0.22	0.0-2.9	2.0-6.0	.32	.32	2	6	48
	6-9	27-40	1.20-1.50	0.06-0.6	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32			
	9-12	27-40	1.20-1.50	0.001-0.2	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32			
	12-20	27-35	1.20-1.50	0.001-0.2	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32			
	20-28	18-35	1.20-1.60	0.06-0.6	0.10-0.14	3.0-5.9	0.0-0.5	.37	.37			
	28-60	18-35	1.20-1.60	0.06-0.6	0.10-0.14	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
341B:(cont.)												
Niobell	0-6	10-27	1.10-1.30	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.32	.32	5	6	48
	6-9	10-27	1.10-1.30	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.32	.32			
	9-19	35-50	1.20-1.50	0.06-0.6	0.15-0.19	6.0-8.9	1.0-3.0	.32	.32			
	19-29	35-45	1.20-1.60	0.06-0.6	0.15-0.19	6.0-8.9	0.0-1.0	.37	.37			
	29-60	18-35	1.20-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.37	.37			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
341C:												
Noonan	0-6	18-27	1.10-1.40	0.6-2	0.20-0.22	0.0-2.9	2.0-6.0	.32	.32	2	6	48
	6-9	27-40	1.20-1.50	0.06-0.6	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32			
	9-12	27-40	1.20-1.50	0.001-0.2	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32			
	12-20	27-35	1.20-1.50	0.001-0.2	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32			
	20-28	18-35	1.20-1.60	0.06-0.6	0.10-0.14	3.0-5.9	0.0-0.5	.37	.37			
	28-60	18-35	1.20-1.60	0.06-0.6	0.10-0.14	3.0-5.9	0.0-0.5	.37	.37			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
403F:												
Rhame	0-8	10-18	1.10-1.50	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	8-26	10-18	1.10-1.50	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	26-34	10-18	1.10-1.50	2-6	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	34-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Arikara	0-1	0-15	0.02-0.15	20-101	0.55-0.65	---	90-100	.32	.32	5	6	48
	1-2	18-35	1.00-1.20	0.6-2	0.18-0.22	0.0-2.9	3.0-6.0	.28	.28			
	2-14	18-35	1.20-1.40	0.6-2	0.18-0.22	3.0-5.9	1.0-2.0	.28	.28			
	14-39	15-35	1.20-1.40	0.6-2	0.15-0.20	3.0-5.9	1.0-2.0	.28	.32			
	39-60	15-35	1.15-1.35	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.28	.32			
Fleak	0-3	3-10	1.10-1.50	6-20	0.06-0.12	0.0-2.9	0.5-1.0	.17	.17	2	2	134
	3-17	1-10	1.10-1.50	6-20	0.06-0.10	0.0-2.9	0.0-0.5	.17	.17			
	17-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
404F:												
Badland, outcrop------	0-60	10-60	1.10-1.50	0.001-2	0.04-0.08	3.0-9.0	0.0-0.3	.43	.43	1	4	86
Lambert----------	0-5	18-27	1.10-1.30	0.6-2	0.18-0.22	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	5-36	18-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	36-60	15-35	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.0-0.5	.37	.37			
Cabba----------	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
406:												
Glendive, wooded------	0-5	10-18	1.40-1.60	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	5-16	8-18	1.30-1.50	2-6	0.15-0.19	0.0-2.9	0.5-1.0	.32	.32			
	16-60	5-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.20	.20			
408B:												
Hanly, wooded---------	0-5	10-18	1.10-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	5-60	1-10	1.20-1.60	6-20	0.05-0.14	0.0-2.9	0.0-0.5	.17	.17			
410:												
Riverwash----------	0-6	1-5	1.40-1.70	6-20	0.03-0.04	0.0-2.9	0.0-0.5	.15	.15	5	1	180
	6-60	1-10	1.40-1.70	6-20	0.04-0.06	0.0-2.9	0.0-0.5	.15	.15			
411B:												
Lambert----------	0-5	18-27	1.10-1.30	0.2-0.6	0.18-0.22	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	5-36	18-35	1.25-1.45	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	36-60	15-35	1.30-1.50	0.2-0.6	0.16-0.20	0.0-2.9	0.0-0.5	.37	.37			
412E:												
Lambert----------	0-5	18-27	1.10-1.30	0.2-0.6	0.18-0.22	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	5-36	18-35	1.25-1.45	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	36-60	15-35	1.30-1.50	0.2-0.6	0.16-0.20	0.0-2.9	0.0-0.5	.37	.37			
Brandenburg----------	0-4	10-25	1.20-1.40	0.6-2	0.12-0.16	0.0-2.9	2.0-3.0	.24	.49	2	7	38
	4-10	5-25	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.0-1.0	.24	.49			
	10-60	1-5	1.00-1.30	20-60	0.01-0.03	0.0-2.9	0.0-0.5	.10	.32			
442F:												
Zahl----------	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
442F:(cont.)												
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
460C:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
460D:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Cabba	0-3	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	3-15	18-35	1.30-1.50	0.6-2	0.14-0.18	0.0-5.9	0.5-1.0	.43	.43			
	15-60	10-35	1.40-1.70	0.06-0.6	0.02-0.08	---	0.0-0.5	.49	.49			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
470C:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Ksat	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
470C:(cont.)												
Tally	0-6	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	6-32	10-18	1.30-1.60	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.20	.20			
	32-60	5-18	1.30-1.60	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
Williams	0-6	15-27	1.20-1.60	0.6-2	0.18-0.20	0.0-2.9	2.0-6.0	.28	.28	5	6	48
	6-10	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	10-15	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	15-24	24-35	1.20-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-4.0	.28	.28			
	24-36	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
	36-60	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.0-1.0	.37	.37			
470D:												
Zahl	0-5	18-27	1.10-1.40	0.6-2	0.17-0.22	3.0-5.9	1.0-4.0	.28	.28	5	4L	86
	5-20	20-30	1.20-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	20-60	20-30	1.30-1.60	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.37	.37			
Beisigl	0-5	3-10	1.20-1.50	6-20	0.11-0.13	0.0-2.9	1.0-3.0	.17	.17	3	2	134
	5-27	1-10	1.30-1.70	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.20			
	27-60	1-10	1.45-1.70	0.06-2	0.02-0.04	---	0.0-0.5	.32	.32			
Tally	0-6	10-18	1.20-1.60	2-6	0.15-0.17	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	6-32	10-18	1.30-1.60	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.20	.20			
	32-60	5-18	1.30-1.60	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
490:												
Riverwash	0-6	1-5	1.40-1.60	6-20	0.03-0.04	0.0-2.9	0.0-0.5	.15	.15	5	1	180
	6-60	1-10	1.40-1.60	6-20	0.04-0.06	0.0-2.9	0.0-0.5	.15	.15			
496:												
Pits, gravel and sand, low precipitation	0-6	1-10	1.20-1.60	6-20	0.01-0.04	0.0-2.9	0.5-1.0	.10	.20	5	8	0
	6-60	1-15	1.20-1.60	6-20	0.01-0.04	0.0-2.9	0.0-0.5	.10	.17			
M-W:												
Miscellaneous water	---	---	---	---	---	---	---	---	---	-	---	---
W:												
Water	---	---	---	---	---	---	---	---	---	-	---	---

Chemical Properties of the Soils

(Dashes (---) indicate that data were not available or were not estimated.)

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
2:								
Heil	0-3	40-50	15-30	5.6-7.3	0	0	0-2	0
	3-24	45-60	20-35	6.1-9.0	0-5	0	4-16	13-25
	24-38	27-50	15-40	7.4-9.0	3-15	0	4-16	0-5
	38-52	27-50	15-40	7.4-9.0	3-15	0-5	4-16	0-5
	52-60	20-50	10-40	7.4-9.0	3-15	0-5	4-16	0-5
3:								
Dimmick	0-3	0-15	75-175	6.1-7.3	---	---	---	---
	3-6	27-40	20-40	6.1-7.8	0	0	0	0
	6-23	40-50	25-45	6.1-8.4	0	0	0	0
	23-63	40-60	20-35	6.6-8.4	0-5	0-2	0	0-1
5:								
Tonka	0-13	18-27	15-35	5.6-7.8	0	0	0	0
	13-19	15-25	15-35	5.6-7.3	0	0	0	0
	19-34	35-45	20-40	5.6-7.8	0-3	0-2	0-2	0-1
	34-50	35-45	10-40	6.6-7.8	1-10	1-5	0-4	0-2
	50-60	18-40	5-35	6.6-8.4	1-15	1-5	0-4	0-2
Hamerly	0-8	18-27	15-30	6.6-8.4	0-10	0	0-2	0
	8-25	18-35	10-20	7.4-8.4	15-35	0-2	0-4	0-2
	25-60	18-35	10-20	7.4-8.4	10-30	0-2	0-4	0-2
7:								
Harriet	0-2	12-27	13-23	6.6-8.4	0-5	0	0-2	0
	2-18	35-50	17-26	7.4-9.0	1-15	0-5	4-16	13-25
	18-28	18-40	12-17	7.9-9.0	5-25	0-5	4-16	2-10
	28-38	10-18	5-15	7.9-9.0	3-15	0-5	8-16	2-10
	38-40	23-35	15-30	7.9-9.0	3-15	0-5	8-16	0-5
	40-60	15-45	13-19	7.9-9.0	3-15	0-5	8-16	0-5
9:								
Grano	0-3	0-15	75-175	6.1-7.3	---	---	---	---
	3-19	40-60	30-70	7.4-8.4	3-15	0	0	0
	19-51	40-60	25-50	7.4-8.4	3-15	0	0	0
	51-63	35-60	15-50	7.4-8.4	1-10	0	0	0
10:								
Banks	0-10	10-18	10-15	6.6-7.8	0-3	0	0	0
	10-60	1-10	0-6	7.4-8.4	1-5	0-2	0	0
10D:								
Seroco	0-3	1-10	1-10	6.1-7.3	0	0	0	0
	3-60	1-10	1-5	6.6-8.4	0-5	0	0	0
Lohler	0-8	40-60	30-45	6.6-8.4	5-15	0	0	0
	8-60	35-60	25-45	7.4-9.0	10-20	0	0	0
11B:								
Patent	0-7	18-27	5-25	7.4-8.4	5-25	0	0	0
	7-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-10
12:								
Trembles	0-9	10-18	5-20	6.6-8.4	3-15	0	0-2	0
	9-59	10-18	5-10	7.4-8.4	5-30	0	0-2	0
	59-80	5-18	0-5	7.4-8.4	5-25	0	0-2	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
13:								
Havrelon	0-13	18-27	10-20	7.4-7.9	1-5	0	0	0
	13-60	15-35	10-20	7.4-7.9	1-5	0-1	2-4	0-1
14:								
Channel	---	---	---	---	---	---	---	---
Korchea	0-6	10-35	10-25	6.6-7.8	0-5	0	0	0
	6-60	18-35	10-25	7.4-8.4	5-15	0	0-2	0
15:								
Korchea	0-6	10-35	10-25	6.6-7.8	0-5	0	0	0
	6-60	18-35	10-25	7.4-8.4	5-15	0	0-2	0
16:								
Ridgelawn	0-9	18-27	10-20	7.4-8.4	5-25	0-1	0-2	0-1
	9-29	18-35	10-25	7.4-8.4	5-25	0-2	0-2	0-1
	29-80	1-10	1-10	7.4-8.4	5-25	0-2	0-2	0-1
17:								
Lohler	0-8	40-60	30-45	6.6-8.4	5-15	0	0	0
	8-60	35-60	25-45	7.4-9.0	10-20	0	0	0
19:								
Hoffmanville	0-8	40-60	25-45	6.6-8.4	5-10	0	0-2	0
	8-26	35-60	20-40	6.6-8.4	5-25	0	0-2	0
	26-50	5-18	0-10	6.6-8.4	5-25	0-1	0-2	0-1
	50-61	27-50	10-40	6.6-8.4	5-30	0-2	0-4	0-1
	61-80	10-27	0-15	6.6-8.4	5-25	0-2	0-4	0-1
20:								
Scorio	0-8	40-60	30-50	7.4-8.4	1-10	0-5	0	0
	8-32	35-60	20-45	7.4-8.4	1-10	0-5	0-4	0-2
	32-60	7-18	5-15	7.4-8.4	3-15	0-5	0-4	0-2
21B:								
Tally	0-6	10-18	5-20	6.1-7.8	0	0	0	0
	6-32	10-18	5-10	6.6-8.4	0	0	0	0
	32-60	5-18	5-10	7.4-8.4	5-15	0	0	0
Parshall	0-12	10-18	7-15	5.6-7.8	0	0	0	0
	12-29	10-18	5-13	6.1-8.4	0-3	0	0	0
	29-48	5-18	5-10	7.4-8.4	0-10	0	0	0
	48-60	5-18	2-5	6.6-8.4	0-10	0	0	0
21C:								
Tally	0-6	10-18	5-20	6.1-7.8	0	0	0	0
	6-32	10-18	5-10	6.6-8.4	0	0	0	0
	32-60	5-18	5-10	7.4-8.4	5-15	0	0	0
Parshall	0-12	10-18	7-15	5.6-7.8	0	0	0	0
	12-29	10-18	5-13	6.1-8.4	0-3	0	0	0
	29-48	5-18	5-10	7.4-8.4	0-10	0	0	0
	48-60	5-18	2-5	6.6-8.4	0-10	0	0	0
22:								
Velva	0-6	10-18	5-15	6.6-7.8	0	0	0	0
	6-13	10-20	5-15	6.6-7.8	1-4	0	0	0
	13-60	10-20	5-15	6.6-8.4	1-15	0	0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
23B:								
Lihen	0-9	1-10	2-12	6.1-7.8	0	0	0	0
	9-24	1-10	2-12	6.1-8.4	0-3	0	0	0
	24-32	1-10	2-10	7.4-8.4	2-15	0	0	0
	32-60	1-10	0-7	7.4-8.4	0-12	0	0	0
Parshall	0-12	10-18	7-15	5.6-7.8	0	0	0	0
	12-29	10-18	5-13	6.1-8.4	0-3	0	0	0
	29-48	5-18	5-10	7.4-8.4	0-10	0	0	0
	48-60	5-18	2-5	6.6-8.4	0-10	0	0	0
23D:								
Beisigl	0-5	3-10	5-15	6.6-8.4	1-5	0	0	0
	5-27	1-10	0-10	7.4-8.4	3-15	0	0-1	0
	27-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
Telfer	0-6	1-10	4-10	6.1-7.3	0-1	0	0	0
	6-60	1-10	2-5	6.6-7.8	0-3	0	0	0
24:								
Arnegard	0-13	18-27	15-25	6.1-7.3	0	0	0	0
	13-36	18-30	10-20	6.1-7.8	0	0	0-2	0
	36-60	15-30	5-15	7.4-8.4	3-20	0	0-2	0
25:								
Farnuf	0-9	18-27	15-20	6.1-7.3	0	0	0	0
	9-23	25-35	20-25	6.1-7.8	0-5	0	0	0
	23-34	18-35	15-20	7.4-8.4	5-15	0	0-2	0
	34-60	15-35	10-15	7.4-8.4	5-10	0	0-2	0
25B:								
Farnuf	0-9	18-27	15-20	6.1-7.3	0	0	0	0
	9-23	25-35	20-25	6.1-7.8	0-5	0	0	0
	23-34	18-35	15-20	7.4-8.4	5-15	0	0-2	0
	34-60	15-35	10-15	7.4-8.4	5-10	0	0-2	0
25C:								
Farnuf	0-9	18-27	15-20	6.1-7.3	0	0	0	0
	9-23	25-35	20-25	6.1-7.8	0-5	0	0	0
	23-34	18-35	15-20	7.4-8.4	5-15	0	0-2	0
	34-60	15-35	10-15	7.4-8.4	5-10	0	0-2	0
26:								
Tansem	0-6	18-27	15-25	6.6-7.8	0	0	0	0
	6-14	18-27	10-20	6.6-7.8	0	0	0	0
	14-28	18-27	10-20	7.4-7.8	15-30	0	0	0
	28-60	10-27	5-10	7.4-8.4	3-15	0	0	0
Roseglen	0-7	18-27	20-30	6.6-7.3	0	0	0	0
	7-24	18-27	10-15	6.6-7.8	1-3	0	0	0
	24-34	18-27	10-15	7.4-8.4	5-20	0	0	0
	34-60	18-27	5-15	7.4-8.4	1-10	0	0	0
26B:								
Tansem	0-6	18-27	15-25	6.6-7.8	0	0	0	0
	6-14	18-27	10-20	6.6-7.8	0	0	0	0
	14-28	18-27	10-20	7.4-7.8	15-30	0	0	0
	28-60	10-27	5-10	7.4-8.4	3-15	0	0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
26B:(cont.)								
Roseglen	0-7	18-27	20-30	6.6-7.3	0	0	0	0
	7-24	18-27	10-15	6.6-7.8	1-3	0	0	0
	24-34	18-27	10-15	7.4-8.4	5-20	0	0	0
	34-60	18-27	5-15	7.4-8.4	1-10	0	0	0
27:								
Golva	0-5	18-27	10-30	6.6-7.3	0	0	0	0
	5-15	18-35	10-25	7.4-8.4	1-5	0	0	0
	15-21	18-35	10-25	7.4-8.4	3-15	0	0	0
	21-40	18-30	5-20	7.9-8.4	5-20	0	0	0
	40-60	18-30	5-20	7.9-8.4	3-15	0	0	0
27B:								
Golva	0-5	18-27	10-30	6.6-7.3	0	0	0	0
	5-15	18-35	10-25	7.4-8.4	1-5	0	0	0
	15-21	18-35	10-25	7.4-8.4	3-15	0	0	0
	21-40	18-30	5-20	7.9-8.4	5-20	0	0	0
	40-60	18-30	5-20	7.9-8.4	3-15	0	0	0
27C:								
Golva	0-5	18-27	10-30	6.6-7.3	0	0	0	0
	5-15	18-35	10-25	7.4-8.4	1-5	0	0	0
	15-21	18-35	10-25	7.4-8.4	3-15	0	0	0
	21-40	18-30	5-20	7.9-8.4	5-20	0	0	0
	40-60	18-30	5-20	7.9-8.4	3-15	0	0	0
29:								
Savage	0-7	27-40	20-40	6.1-7.8	0	0	0	0
	7-25	35-50	25-40	6.6-7.8	0	0	0	0
	25-51	35-45	20-35	7.4-8.4	5-15	0	0-2	0
	51-80	35-45	20-35	7.4-8.4	5-15	0-2	0-4	0
29B:								
Savage	0-7	27-40	20-40	6.1-7.8	0	0	0	0
	7-25	35-50	25-40	6.6-7.8	0	0	0	0
	25-51	35-45	20-35	7.4-8.4	5-15	0	0-2	0
	51-80	35-45	20-35	7.4-8.4	5-15	0-2	0-4	0
29C:								
Savage	0-7	27-40	20-40	6.1-7.8	0	0	0	0
	7-25	35-50	25-40	6.6-7.8	0	0	0	0
	25-51	35-45	20-35	7.4-8.4	5-15	0	0-2	0
	51-60	35-45	20-35	7.4-8.4	5-15	0-2	0-4	0
30:								
Lawther	0-10	40-60	20-45	6.6-8.4	1-3	0	0-2	0
	10-33	35-60	20-50	7.4-8.4	0-10	0	0-4	0
	33-47	35-60	20-50	7.9-8.4	3-15	0-2	4-8	0-2
	47-60	27-60	15-50	7.9-8.4	3-15	0-2	8-16	0-2
31B:								
Cherry	0-3	18-27	10-20	6.6-7.8	1-3	0	0	0
	3-33	18-35	10-25	7.9-8.4	3-15	0	0	0
	33-60	18-50	10-30	7.9-8.4	3-15	0	0-8	0
31C:								
Cherry	0-3	18-27	10-20	6.6-7.8	1-3	0	0	0
	3-33	18-35	10-25	7.9-8.4	3-15	0	0	0
	33-60	18-50	10-30	7.9-8.4	3-15	0	0-8	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
32F:								
Cherry	0-3	18-27	10-20	6.6-7.8	1-3	0	0	0
	3-33	18-35	10-25	7.9-8.4	3-15	0	0	0
	33-60	18-50	10-30	7.9-8.4	3-15	0	0-8	0
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
33:								
Belfield	0-9	27-35	15-30	6.1-7.3	0	0-1	0-1	0-1
	9-12	27-35	15-30	6.1-7.3	0	0-1	0-1	0-1
	12-17	35-45	20-40	7.3-8.4	1-5	0-1	0-2	5-10
	17-24	35-45	20-30	7.3-8.4	1-5	0-1	0-2	5-10
	24-43	27-45	15-40	7.9-8.4	3-15	0-5	5-15	10-20
	43-60	27-45	15-35	7.9-8.4	3-15	0-5	5-15	10-20
Grail	0-10	27-35	20-30	6.1-7.3	0	0	0-2	0
	10-24	35-45	20-30	6.6-8.4	1-5	0	0-2	0-1
	24-52	27-45	15-30	7.4-8.4	1-15	0	0-2	0-1
	52-60	18-45	15-25	7.4-8.4	1-15	0-2	0-4	0-2
33B:								
Belfield	0-9	27-35	15-30	6.1-7.3	0	0	0-2	0-3
	9-12	27-35	15-30	6.1-7.3	0	0	0-2	0-3
	12-17	35-45	20-40	6.6-8.4	1-5	0	0-4	4-15
	17-24	35-45	20-30	6.6-8.4	1-5	0	0-4	4-15
	24-43	27-45	15-40	7.4-9.0	3-15	0-5	2-6	4-15
	43-60	27-45	15-35	7.9-9.0	3-15	0-5	4-16	4-20
Savage	0-7	27-40	20-40	6.1-7.8	0	0	0	0
	7-25	35-50	25-40	6.6-7.8	0	0	0	0
	25-51	35-45	20-35	7.4-8.4	5-15	0	0-2	0
	51-80	35-45	20-35	7.4-8.4	5-15	0-2	0-4	0
34B:								
Daglum	0-7	18-27	10-30	6.1-7.3	0	0-1	0-1	0-1
	7-8	18-27	10-30	6.1-7.3	0	0-1	0-1	0-2
	8-18	35-60	20-50	7.3-8.4	0-3	0-1	0-2	5-10
	18-32	35-60	20-50	7.9-9.0	3-15	0-5	5-15	10-20
	32-47	35-60	20-50	7.9-9.0	5-25	0-5	5-15	10-20
	47-60	35-60	10-40	7.9-9.0	3-15	0-5	5-15	10-20
Belfield	0-9	18-27	15-30	6.1-7.3	0	0	0-2	0-3
	9-12	27-35	15-30	6.1-7.3	0	0	0-2	0-3
	12-17	35-45	20-40	6.6-8.4	1-5	0	0-4	4-15
	17-24	35-45	20-30	6.6-8.4	1-5	0	0-4	4-15
	24-43	27-45	15-40	7.4-9.0	3-15	0-5	2-6	4-15
	43-60	27-45	15-35	7.9-9.0	3-15	0-5	4-16	4-20
36B:								
Rhoades	0-3	18-27	20-35	6.1-7.9	0	0-1	0-1	0-1
	3-8	35-50	20-45	7.4-8.4	0-5	0-1	0-5	5-10
	8-14	35-50	20-45	7.9-8.4	3-15	0-5	5-15	2-20
	14-46	20-50	15-35	7.9-8.4	3-15	0-5	5-15	5-25
	46-60	20-45	15-35	7.9-8.4	5-25	0-5	5-15	5-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
36B:(cont.)								
Daglum	0-7	18-27	10-30	6.1-7.3	0	0-1	0-1	0-1
	7-8	18-27	10-30	6.1-7.3	0	0-1	0-1	0-2
	8-18	35-60	20-50	7.3-8.4	0-3	0-1	0-2	5-10
	18-32	35-60	20-50	7.9-9.0	3-15	0-5	5-15	10-20
	32-47	35-60	20-50	7.9-9.0	5-25	0-5	5-15	10-20
	47-60	20-45	10-40	7.9-9.0	3-15	0-5	5-15	10-20
38B:								
Dogtooth	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-8	35-50	20-50	7.4-8.4	1-15	0-1	0-5	5-10
	8-13	35-50	20-50	7.9-8.4	3-15	0-5	5-15	10-25
	13-21	18-50	10-55	7.9-8.4	3-15	0-5	5-15	10-25
	21-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-25
Janesburg	0-8	18-27	15-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	15-27	10-25	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-50	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	5-40	7.9-8.4	0-5	0-5	5-15	10-20
38F:								
Dogtooth	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-8	35-50	20-50	7.4-8.4	1-15	0-1	0-5	5-10
	8-13	35-50	20-50	7.9-8.4	3-15	0-5	5-15	10-25
	13-21	18-50	10-55	7.9-8.4	3-15	0-5	5-15	10-25
	21-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-25
Janesburg	0-8	18-27	15-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	15-27	10-25	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-50	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	5-40	7.9-8.4	0-5	0-5	5-15	10-20
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
40B:								
Desart	0-20	10-18	1-10	6.1-7.8	0	0	0	0-5
	20-24	5-15	1-10	6.1-8.4	1-5	0	0	0-5
	24-31	10-18	5-15	8.5-9.0	1-5	0-2	2-8	13-25
	31-60	5-20	5-10	7.9-9.0	1-5	0-2	4-16	5-25
Janesburg	0-8	18-27	15-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	15-27	10-20	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-50	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-20
Ekalaka	0-6	10-18	5-15	5.1-7.8	0	0	0-2	0-2
	6-12	5-18	5-15	5.1-8.4	0	0	0-2	0-4
	12-17	10-18	5-15	6.6-9.0	1-5	0-2	2-8	4-30
	17-33	5-18	5-15	7.4-9.0	3-15	0-2	4-12	5-25
	33-60	5-18	5-15	7.4-9.0	1-5	0-2	8-16	20-50

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
41:								
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
Bowbells	0-6	18-27	15-25	6.1-7.3	0	0	0	0
	6-14	18-35	15-25	6.1-7.8	0-5	0	0	0
	14-23	18-35	15-25	6.1-7.8	0-5	0	0	0
	23-36	18-35	15-25	7.4-8.4	5-25	0-1	0	0
	36-60	18-35	15-25	7.4-8.4	5-15	0-1	0-2	0-1
41B:								
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
Bowbells	0-6	18-27	15-25	6.1-7.3	0	0	0	0
	6-14	18-35	15-25	6.1-7.8	0-5	0	0	0
	14-23	18-35	15-25	6.1-7.8	0-5	0	0	0
	23-36	18-35	15-25	7.4-8.4	5-25	0-1	0	0
	36-60	18-35	15-25	7.4-8.4	5-15	0-1	0-2	0-1
42B:								
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
42C:								
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
43C:								
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
44D:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
44E:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
45F:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Maschetah	0-7	20-27	10-20	7.4-8.4	0-6	0	0	0
	7-48	20-35	10-20	7.9-8.4	20-40	0	0	0
	48-90	20-35	5-15	7.9-8.4	15-40	0	0-4	0
46B:								
Dooley	0-6	10-18	8-20	6.6-7.8	0	0	0	0
	6-15	20-35	8-23	6.6-7.8	5-20	0	0	0
	15-24	15-25	5-20	6.6-8.4	10-30	0	0	0
	24-60	25-45	10-25	7.4-8.4	5-20	0-2	0-2	0-5
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
46C:								
Dooley	0-6	10-18	8-20	6.6-7.8	0	0	0	0
	6-15	20-35	8-23	6.6-7.8	5-20	0	0	0
	15-24	15-25	5-20	6.6-8.4	10-30	0	0	0
	24-60	25-45	10-25	7.4-8.4	5-20	0-2	0-2	0-5
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
46D:								
Dooley	0-6	10-18	8-20	6.6-7.8	0	0	0	0
	6-15	20-35	8-23	6.6-7.8	5-20	0	0	0
	15-24	15-25	5-20	6.6-8.4	10-30	0	0	0
	24-60	25-45	10-25	7.4-8.4	5-20	0-2	0-2	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
46D:(cont.)								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
48:								
Temvik	0-7	18-27	10-25	6.6-7.3	0	0	0	0
	7-24	18-30	10-25	6.6-7.8	0-3	0	0	0
	24-44	18-35	5-20	7.4-8.4	4-20	0	0	0
	44-60	18-35	5-20	7.4-8.4	3-15	0	0	0
Wilton	0-8	18-27	10-30	6.1-7.3	0	0	0	0
	8-27	18-27	10-20	6.6-7.8	0-5	0	0	0
	27-60	18-35	5-25	7.4-8.4	1-15	0	0	0
49:								
Temvik	0-7	18-27	10-25	6.6-7.3	0	0	0	0
	7-24	18-30	10-25	6.6-7.8	0-3	0	0	0
	24-44	18-35	5-20	7.4-8.4	4-20	0	0	0
	44-60	18-35	5-20	7.4-8.4	3-15	0	0	0
Williams	0-6	18-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
49B:								
Temvik	0-7	18-27	10-25	6.6-7.3	0	0	0	0
	7-24	18-30	10-25	6.6-7.8	0-3	0	0	0
	24-44	18-35	5-20	7.4-8.4	4-20	0	0	0
	44-60	18-35	5-20	7.4-8.4	3-15	0	0	0
Williams	0-6	18-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
50B:								
Temvik	0-7	18-27	10-25	6.6-7.3	0	0	0	0
	7-24	18-30	10-25	6.6-7.8	0-3	0	0	0
	24-44	18-35	5-20	7.4-8.4	4-20	0	0	0
	44-60	18-35	5-20	7.4-8.4	3-15	0	0	0
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
51B:								
Amor	0-8	15-25	15-20	6.1-7.8	0	0	0	0
	8-19	18-30	15-20	6.6-7.8	0-5	0	0	0
	19-31	18-30	10-15	7.4-8.4	5-30	0-2	0-2	0-2
	31-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Shambo	0-9	18-27	10-25	6.1-7.8	0	0	0	0
	9-13	18-30	10-20	6.6-7.8	0	0	0	0
	13-29	18-30	10-20	6.6-8.4	0-5	0	0	0
	29-48	18-30	10-20	7.4-8.4	5-20	0	0	0
	48-60	18-35	10-15	7.4-8.4	1-15	0	0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
51C:								
Amor	0-8	15-25	15-20	6.1-7.8	0	0	0	0
	8-19	18-30	15-20	6.6-7.8	0-5	0	0	0
	19-31	18-30	10-15	7.4-8.4	5-30	0-2	0-2	0-2
	31-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
51D:								
Amor	0-8	15-25	15-20	6.1-7.8	0	0	0	0
	8-19	18-30	15-20	6.6-7.8	0-5	0	0	0
	19-31	18-30	10-15	7.4-8.4	5-30	0-2	0-2	0-2
	31-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
52B:								
Reeder	0-8	18-27	20-30	6.1-7.8	0	0	0	0
	8-17	18-35	15-30	6.6-7.8	0	0	0	0
	17-36	18-35	15-30	7.4-8.4	10-20	0-1	0	0-2
	36-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Farnuf	0-9	18-27	15-20	6.1-7.3	0	0	0	0
	9-23	25-35	20-25	6.1-7.8	0-5	0	0	0
	23-34	18-35	15-20	7.4-8.4	5-15	0	0-2	0
	34-60	15-35	10-15	7.4-8.4	5-10	0	0-2	0
52C:								
Reeder	0-8	18-27	20-30	6.1-7.8	0	0	0	0
	8-17	18-35	15-30	6.6-7.8	0	0	0	0
	17-36	18-35	15-30	7.4-8.4	10-20	0-1	0	0-2
	36-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
53B:								
Chama	0-4	15-27	10-30	6.6-8.4	0-2	0	0-2	0
	4-8	18-35	10-25	7.4-8.4	3-10	0	0-2	0
	8-34	18-35	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	10-35	5-20	7.4-8.4	0-15	0-5	0-8	0-4
Sen	0-6	18-27	10-25	6.6-7.8	0	0	0-2	0
	6-17	18-35	10-25	6.6-8.4	1-3	0	0-2	0
	17-34	18-30	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	15-35	5-20	7.4-8.4	0-15	0-2	0-8	0-4
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
53C:								
Chama	0-4	15-27	10-30	6.6-8.4	0-2	0	0-2	0
	4-8	18-35	10-25	7.4-8.4	3-10	0	0-2	0
	8-34	18-35	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	10-35	5-20	7.4-8.4	0-15	0-5	0-8	0-4

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
53C:(cont.)								
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Sen	0-6	18-27	10-25	6.6-7.8	0	0	0-2	0
	6-17	18-35	10-25	6.6-8.4	1-3	0	0-2	0
	17-34	18-30	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	15-35	5-20	7.4-8.4	0-15	0-2	0-8	0-4
53D:								
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Chama	0-4	15-27	10-30	6.6-8.4	0-2	0	0-2	0
	4-8	18-35	10-25	7.4-8.4	3-10	0	0-2	0
	8-34	18-35	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	10-35	5-20	7.4-8.4	0-15	0-5	0-8	0-4
Sen	0-6	18-27	10-25	6.6-7.8	0	0	0-2	0
	6-17	18-35	10-25	6.6-8.4	1-3	0	0-2	0
	17-34	18-30	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	15-35	5-20	7.4-8.4	0-15	0-2	0-8	0-4
54F:								
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Sen	0-6	18-27	10-25	6.6-7.8	0	0	0-2	0
	6-17	18-35	10-25	6.6-8.4	1-3	0	0-2	0
	17-34	18-30	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	15-35	5-20	7.4-8.4	0-15	0-2	0-8	0-4
Chama	0-4	15-27	10-30	6.6-8.4	0-2	0	0-2	0
	4-8	18-35	10-25	7.4-8.4	3-10	0	0-2	0
	8-34	18-35	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	10-35	5-20	7.4-8.4	0-15	0-5	0-8	0-4
55B:								
Sen	0-6	18-27	10-25	6.6-7.8	0	0	0-2	0
	6-17	18-35	10-25	6.6-8.4	1-3	0	0-2	0
	17-34	18-30	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	15-35	5-20	7.4-8.4	0-15	0-2	0-8	0-4
Janesburg	0-8	18-27	15-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	15-27	10-25	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-50	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	5-40	7.9-8.4	0-5	0-5	5-15	10-20
56B:								
Lefor	0-7	10-25	10-20	5.1-7.3	0	0	0	0
	7-15	10-25	5-20	5.6-7.3	0	0	0	0
	15-30	18-27	10-15	6.6-7.8	0	0	0	0
	30-36	10-25	5-10	7.4-8.4	3-15	0	0	0
	36-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
56C:								
Lefor	0-7	10-25	10-20	5.1-7.3	0	0	0	0
	7-15	10-25	5-20	5.6-7.3	0	0	0	0
	15-30	18-27	10-15	6.6-7.8	0	0	0	0
	30-36	10-25	5-10	7.4-8.4	3-15	0	0	0
	36-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
61D:								
Beisigl	0-5	3-10	5-15	6.6-8.4	1-5	0	0	0
	5-27	1-10	0-10	7.4-8.4	3-15	0	0-1	0
	27-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
Flasher	0-6	3-10	3-5	6.6-8.4	0	0	0	0
	6-10	1-10	2-5	6.6-8.4	1-10	0	0	0
	10-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
61F:								
Beisigl	0-5	3-10	5-15	6.6-8.4	1-5	0	0	0
	5-27	1-10	0-10	7.4-8.4	3-15	0	0-1	0
	27-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
Flasher	0-6	3-10	3-5	6.6-8.4	0	0	0	0
	6-10	1-10	2-5	6.6-8.4	1-10	0	0	0
	10-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
Tally	0-6	5-20	5-20	6.1-7.8	0	0	0	0
	6-32	5-18	5-10	6.6-8.4	0	0	0	0
	32-60	5-18	5-10	7.4-8.4	5-15	0	0	0
62F:								
Flasher	0-6	3-10	3-5	6.6-8.4	0	0	0	0
	6-10	1-10	2-5	6.6-8.4	1-10	0	0	0
	10-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
Rock outcrop	---	---	---	---	---	---	---	---
Vebar	0-5	10-18	10-15	6.1-7.8	0	0	0	0
	5-26	10-18	10-15	6.1-7.8	0	0	0	0
	26-32	10-18	5-10	7.4-8.4	1-10	0	0	0
	32-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
63B:								
Vebar	0-5	10-18	10-15	6.1-7.8	0	0	0	0
	5-26	10-18	10-15	6.1-7.8	0	0	0	0
	26-32	10-18	5-10	7.4-8.4	1-10	0	0	0
	32-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
Flasher	0-6	3-10	3-5	6.6-8.4	0	0	0	0
	6-10	1-10	2-5	6.6-8.4	1-10	0	0	0
	10-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
63C:								
Vebar	0-5	10-18	10-15	6.1-7.8	0	0	0	0
	5-26	10-18	10-15	6.1-7.8	0	0	0	0
	26-32	10-18	5-10	7.4-8.4	1-10	0	0	0
	32-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
Flasher	0-6	3-10	3-5	6.6-8.4	0	0	0	0
	6-10	1-10	2-5	6.6-8.4	1-10	0	0	0
	10-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
63D:								
Vebar	0-5	10-18	10-15	6.1-7.8	0	0	0	0
	5-26	10-18	10-15	6.1-7.8	0	0	0	0
	26-32	10-18	5-10	7.4-8.4	1-10	0	0	0
	32-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
Flasher	0-6	3-10	3-5	6.6-8.4	0	0	0	0
	6-10	1-10	2-5	6.6-8.4	1-10	0	0	0
	10-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
Tally	0-6	10-18	5-20	6.1-7.8	0	0	0	0
	6-32	10-18	5-10	6.6-8.4	0	0	0	0
	32-60	5-18	5-10	7.4-8.4	5-15	0	0	0
66B:								
Manning	0-5	10-18	10-20	6.1-7.3	0	0	0	0
	5-18	10-20	5-20	6.6-7.8	0	0	0	0
	18-25	10-20	5-15	7.4-8.4	5-20	0	0	0
	25-60	1-10	1-5	7.4-8.4	0-5	0	0	0
70B:								
Regent	0-10	27-40	15-30	6.1-7.8	0	0	0	0
	10-26	35-50	20-35	7.4-8.4	1-3	0-4	0	0-1
	26-39	35-50	20-40	7.4-8.4	3-15	0-4	0-2	0-2
	39-60	10-90	10-55	7.4-8.4	0-15	0-5	0-4	0-4
Savage	0-7	27-40	20-40	6.1-7.8	0	0	0	0
	7-25	35-50	25-40	6.6-7.8	0	0	0	0
	25-51	35-45	20-35	7.4-8.4	5-15	0	0-2	0
	51-60	35-45	20-35	7.4-8.4	5-15	0-2	0-4	0
70C:								
Regent	0-10	27-40	15-30	6.1-7.8	0	0	0	0
	10-26	35-50	20-35	7.4-8.4	1-3	0-4	0	0-1
	26-39	35-50	20-40	7.4-8.4	3-15	0-4	0-2	0-2
	39-60	10-90	10-55	7.4-8.4	0-15	0-5	0-4	0-4
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
71B:								
Regent	0-10	27-40	15-30	6.1-7.8	0	0	0	0
	10-26	35-50	20-35	7.4-8.4	1-3	0-4	0	0
	26-39	35-50	20-40	7.4-8.4	3-15	0-4	0-2	0-2
	39-60	10-90	10-55	7.4-8.4	0-15	0-5	0-4	0-4
Janesburg	0-8	18-27	15-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	10-27	10-25	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-50	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-20
71C:								
Regent	0-10	27-40	15-30	6.1-7.8	0	0	0	0
	10-26	35-50	20-35	7.4-8.4	1-3	0-4	0	0-1
	26-39	35-50	20-40	7.4-8.4	3-15	0-4	0-2	0-2
	39-60	10-90	10-55	7.4-8.4	0-15	0-5	0-4	0-4

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
71C:(cont.)								
Janesburg	0-8	18-27	15-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	10-27	10-25	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-50	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-20
72B:								
Moreau	0-6	40-50	25-50	7.4-8.4	0-5	0	0-2	0
	6-13	35-60	20-55	7.4-9.0	1-10	0-1	0-4	0
	13-35	35-60	20-50	7.4-9.0	5-20	0-2	2-16	0-2
	35-60	30-90	10-40	7.4-8.4	0-15	0-5	0-8	0-4
72C:								
Moreau	0-6	40-50	25-50	7.4-8.4	0-5	0	0-2	0
	6-13	35-60	20-55	7.4-9.0	1-10	0-1	0-4	0
	13-35	35-60	20-50	7.4-9.0	5-20	0-2	2-16	0-2
	35-60	30-90	10-40	7.4-8.4	0-15	0-5	0-8	0-4
Wayden	0-3	40-50	20-40	6.6-9.0	0-10	0	0-2	0
	3-15	35-50	20-40	7.4-9.0	3-25	0-2	2-16	0-2
	15-60	30-90	10-40	7.4-8.4	0-15	0-5	0-8	0-4
72D:								
Moreau	0-6	40-50	25-50	7.4-8.4	0-5	0	0-2	0
	6-13	35-60	20-55	7.4-9.0	1-10	0-1	0-4	0
	13-35	35-60	20-50	7.4-9.0	5-20	0-2	2-16	0-2
	35-60	30-90	10-40	7.4-8.4	0-15	0-5	0-8	0-4
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
80:								
Badland, high precipitation	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
83F:								
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-4	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	2-8	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	0-8	0-4
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
84F:								
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Chama	0-4	15-27	10-30	6.6-8.4	0-2	0	0-2	0
	4-8	18-35	10-25	7.4-8.4	3-10	0	0-2	0
	8-34	18-35	10-25	7.4-8.4	10-30	0	0-2	0
	34-60	10-35	5-20	7.4-8.4	0-15	0-5	0-8	0-4
Havrelon	0-13	18-27	10-20	7.4-7.9	1-5	0	0	0
	13-60	15-35	10-20	7.4-7.9	1-5	0-1	2-4	0-1
88D:								
Brandenburg	0-4	10-25	10-25	6.6-7.8	1-5	0	0	0
	4-10	5-25	0-20	6.6-8.4	3-15	0	0	0
	10-60	1-5	0-3	6.6-8.4	3-15	0	0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
88D:(cont.)								
Searing	0-8	18-27	15-30	6.1-7.3	0	0	0	0
	8-23	18-27	10-25	6.6-8.4	1-3	0	0	0
	23-33	18-27	10-20	7.4-8.4	3-15	0	0	0
	33-60	1-5	0-5	7.4-8.4	3-15	0	0	0
Dogtooth	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-8	35-50	20-50	7.4-8.4	1-15	0-1	0-5	5-10
	8-13	35-50	20-50	7.9-8.4	3-15	0-5	5-15	10-25
	13-21	18-50	10-55	7.9-8.4	3-15	0-5	5-15	10-25
	21-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-25
88F:								
Brandenburg	0-4	10-25	10-25	6.6-7.8	1-5	0	0	0
	4-10	5-25	0-20	6.6-8.4	3-15	0	0	0
	10-60	1-5	0-3	6.6-8.4	3-15	0	0	0
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Dogtooth	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-8	35-50	20-50	7.4-8.4	1-15	0-1	0-5	5-10
	8-13	35-50	20-50	7.9-8.4	3-15	0-5	5-15	10-25
	13-21	18-50	10-55	7.9-8.4	3-15	0-5	5-15	10-25
	21-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-25
89F:								
Brandenburg	0-4	10-25	10-25	6.6-7.8	1-5	0	0	0
	4-10	5-25	0-20	6.6-8.4	3-15	0	0	0
	10-60	0-5	0-3	6.6-8.4	3-15	0	0	0
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
90E:								
Manning	0-5	10-18	10-20	6.1-7.3	0	0	0	0
	5-18	10-20	5-20	6.6-7.8	0	0	0	0
	18-25	10-20	5-15	7.4-8.4	5-20	0	0	0
	25-60	1-10	1-5	7.4-8.4	0-5	0	0	0
Schaller	0-9	10-18	5-10	6.6-7.8	0	0	0	0
	9-15	5-18	2-8	6.6-8.4	1-15	0	0	0
	15-60	1-10	2-5	6.6-8.4	1-10	0	0	0
Wabek	0-5	15-27	5-10	6.6-8.4	0-5	0	0	0
	5-9	10-25	1-5	7.4-8.4	1-15	0	0	0
	9-60	1-10	0-5	7.4-8.4	1-15	0	0	0
91F:								
Wabek	0-5	15-27	5-10	6.6-8.4	0-5	0	0	0
	5-9	10-25	1-5	7.4-8.4	1-15	0	0	0
	9-60	1-10	0-5	7.4-8.4	1-15	0	0	0
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
93B:								
Lehr	0-6	18-27	15-30	6.6-7.8	0	0	0	0
	6-11	18-30	10-30	6.6-7.8	0-5	0	0	0
	11-15	18-27	10-30	6.6-8.4	0-15	0	0	0
	15-22	5-18	0-5	7.4-8.4	0-10	0	0	0
	22-60	1-10	0-5	7.4-8.4	0-10	0	0	0
Stady	0-6	18-27	10-20	6.6-7.3	0	0	0	0
	6-15	18-27	10-20	6.6-7.3	0	0	0	0
	15-29	18-27	10-15	7.4-8.4	1-10	0	0	0
	29-60	1-10	1-5	7.4-8.4	3-15	0	0	0
94B:								
Searing	0-8	18-27	15-30	6.1-7.3	0	0	0	0
	8-23	18-27	10-25	6.6-8.4	1-3	0	0	0
	23-33	18-27	10-20	7.4-8.4	3-15	0	0	0
	33-60	1-5	0-5	7.4-8.4	3-15	0	0	0
Ringling	0-5	18-27	10-25	6.6-7.8	0	0	0	0
	5-17	18-27	5-20	6.6-7.8	1-3	0	0	0
	17-42	1-5	0-5	6.6-8.4	5-10	0	0	0
	42-60	1-5	0-5	6.6-8.4	1-5	0	0	0
95:								
Havrelon	0-13	40-50	30-40	6.6-8.4	5-15	0-1	0-2	0-1
	13-60	15-35	10-20	7.4-7.9	1-5	0-1	2-4	0-1
96:								
Pits, gravel and sand	0-6	1-10	2-12	6.6-8.4	0-3	0	0	0
	6-60	1-15	1-10	6.6-8.4	5-20	0	0	0
98F:								
Tinsley	0-3	5-15	5-10	6.6-7.8	1-3	0	0	0
	3-60	0-10	1-5	6.6-8.4	1-10	0	0-2	0
Chanta	0-6	18-27	10-25	6.1-7.3	0	0	0	0
	6-22	18-30	10-25	6.1-7.8	0	0	0	0
	22-26	10-20	5-15	6.6-8.4	1-3	0	0	0
	26-60	1-10	1-5	7.4-8.4	1-15	0	0	0
99:								
Mckeen	0-2	18-27	5-20	6.6-7.8	1-10	0	0	0
	2-12	18-27	5-20	7.4-8.4	3-25	0	0	0
	12-15	20-50	5-35	6.6-8.4	1-10	0	0	0
	15-60	5-50	2-35	7.4-8.4	3-25	0	0-4	0
100F:								
Boxwell	0-5	18-27	10-20	6.1-7.3	0	0	0	0
	5-14	18-30	10-25	6.6-7.8	0	0	0-2	0
	14-28	18-27	5-20	7.4-8.4	15-30	0	0-4	0
	28-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
101F:								
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
102B:								
Kremlin	0-11	18-27	10-25	6.1-7.8	0	0	0	0
	11-19	18-30	5-20	6.6-7.8	0	0	0	0
	19-60	18-30	5-20	7.4-8.4	5-30	0	0-2	0
Ethridge	0-3	18-27	15-30	6.1-7.8	0	0	0	0
	3-10	35-50	25-40	6.6-8.4	0	0	0	0
	10-23	35-50	25-40	7.4-9.0	5-15	1-5	0	0
	23-38	27-45	20-40	7.4-9.0	5-15	1-5	0	1-5
	38-60	20-35	15-35	7.4-9.0	5-15	1-3	2-4	1-5
Gerda	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-1
	2-11	35-55	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	11-19	35-55	25-40	7.9-8.4	5-25	0-5	5-15	2-20
	19-29	30-45	20-40	7.9-8.4	5-25	0-5	5-15	5-20
	29-44	30-50	20-40	7.9-8.4	5-25	0-5	5-15	5-25
	44-80	15-27	10-25	7.9-8.4	3-15	0-5	5-15	5-25
103B:								
Chinook	0-6	10-18	5-15	6.6-7.8	0	0	0	0
	6-15	10-18	5-15	6.6-7.8	0	0	0	0
	15-40	10-18	5-15	6.6-7.8	3-15	0	0	0
	40-66	5-18	5-10	6.6-8.4	1-15	0	0-2	0
Rhame	0-8	10-18	5-15	6.1-7.3	0	0	0	0
	8-26	10-18	5-10	6.6-7.8	0-3	0	0	0
	26-34	10-18	5-10	6.6-8.4	1-10	0	0	0
	34-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
103D:								
Rhame	0-8	10-18	5-15	6.1-7.3	0	0	0	0
	8-26	10-18	5-10	6.6-7.8	0-3	0	0	0
	26-34	10-18	5-10	6.6-8.4	1-10	0	0	0
	34-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
Chinook	0-6	10-18	5-15	6.6-7.8	0	0	0	0
	6-15	10-18	5-15	6.6-7.8	0	0	0	0
	15-40	10-18	5-15	6.6-7.8	3-15	0	0	0
	40-66	5-18	5-10	6.6-8.4	1-15	0	0-2	0
103F:								
Rhame	0-8	10-18	5-15	6.1-7.3	0	0	0	0
	8-26	10-18	5-10	6.6-7.8	0-3	0	0	0
	26-34	10-18	5-10	6.6-8.4	1-10	0	0	0
	34-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
Fleak	0-3	3-10	1-10	6.6-7.8	0	0	0	0
	3-17	1-10	1-10	6.6-8.4	1-10	0	0	0
	17-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
104E:								
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
Patent	0-7	18-27	5-25	7.4-8.4	5-25	0	0	0
	7-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-19

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
105:								
Havre	0-10	18-27	10-15	7.4-8.4	1-10	0	0	0
	10-60	18-35	10-15	7.4-8.4	1-10	0	0-2	0
106:								
Glendive	0-5	10-18	5-15	6.6-9.0	5-30	0	0-4	0
	5-16	8-18	5-15	7.4-9.0	5-30	0	0-4	0
	16-60	5-18	5-15	7.4-9.0	5-30	0	0-8	0
107:								
Kremlin	0-11	18-27	10-25	6.1-7.8	0	0	0	0
	11-19	18-30	5-20	6.6-7.8	0	0	0	0
	19-60	18-30	5-20	7.4-8.4	5-30	0	0-2	0
108B:								
Hanly	0-5	10-18	5-15	6.6-8.4	0	0	0	0
	5-60	1-10	1-5	6.6-8.4	1-5	0	0-2	0
109:								
Havre, wooded	0-10	18-27	10-15	7.4-8.4	1-10	0	0	0
	10-60	18-35	10-15	7.4-8.4	1-10	0	0-2	0
110B:								
Maltese	0-7	18-27	15-30	6.1-7.3	0	0-1	0-1	0-1
	7-10	18-27	15-30	6.1-7.3	0	0-1	0-1	0-1
	10-16	40-60	25-45	7.3-8.4	1-3	0-1	0-2	5-10
	16-20	35-50	25-45	7.9-9.0	5-20	0-5	5-15	10-20
	20-33	35-50	25-45	7.9-9.0	3-15	0-5	5-15	10-20
	33-60	15-40	10-30	7.9-9.0	3-15	0-5	5-15	10-20
Gerda	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-1
	2-11	35-55	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	11-19	35-55	25-40	7.9-8.4	5-25	0-5	5-15	2-20
	19-29	30-45	20-40	7.9-8.4	5-25	0-5	5-15	5-20
	29-44	30-50	20-40	7.9-8.4	5-25	0-5	5-15	5-25
	44-80	15-27	10-25	7.9-8.4	3-15	0-5	5-15	5-25
111D:								
Gerda	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-1
	2-11	35-55	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	11-19	35-55	25-40	7.9-8.4	5-25	0-5	5-15	2-20
	19-29	30-45	20-40	7.9-8.4	5-25	0-5	5-15	5-20
	29-44	30-50	20-40	7.9-8.4	5-25	0-5	5-15	5-25
	44-80	15-27	10-25	7.9-8.4	3-15	0-5	5-15	5-25
Kirby	0-4	10-22	10-15	7.4-8.4	1-5	0	0-2	0
	4-12	10-22	5-10	7.9-8.4	5-15	0	0-2	0
	12-60	1-5	0-0	7.9-8.4	1-5	0	0-2	0
111F:								
Kirby	0-4	10-22	10-15	7.4-8.4	1-5	0	0-2	0
	4-12	10-22	5-10	7.9-8.4	5-15	0	0-2	0
	12-60	1-5	0-0	7.9-8.4	1-5	0	0-2	0
Scairt	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-6	35-55	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	6-13	35-55	25-45	7.9-8.4	1-5	0-5	5-15	10-25
	13-22	18-50	10-40	7.9-8.4	3-15	0-5	5-15	10-25
	22-28	18-50	10-40	7.9-8.4	5-25	0-5	5-15	10-25
	28-60	10-90	5-40	7.9-8.4	1-15	0-5	5-15	10-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
112F:								
Kirby	0-4	10-22	10-15	7.4-8.4	1-5	0	0-2	0
	4-12	10-22	5-10	7.9-8.4	5-15	0	0-2	0
	12-60	1-5	0-0	7.9-8.4	1-5	0	0-2	0
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
Patent	0-7	18-27	5-25	7.4-8.4	5-25	0	0	0
	7-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-10
113F:								
Lonna	0-2	18-27	15-20	7.4-8.4	5-10	0	0-2	0
	2-11	18-35	10-15	7.4-8.4	5-10	0	0-2	0
	11-34	18-35	10-15	7.9-9.0	5-15	0-2	2-8	1-5
	34-60	10-35	5-15	7.9-9.0	5-15	0	2-8	10-30
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
114:								
Channel	---	---	---	---	---	---	---	---
Glendive	0-5	10-18	5-15	6.6-9.0	5-30	0	0-4	0
	5-16	8-18	5-15	7.4-9.0	5-30	0	0-4	0
	16-60	5-18	5-15	7.4-9.0	5-30	0	0-8	0
Havre	0-10	18-27	10-15	7.4-8.4	1-10	0	0	0
	10-60	18-35	10-15	7.4-8.4	1-10	0	0-2	0
115F:								
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
116F:								
Kremlin	0-11	18-27	10-25	6.1-7.8	0	0	0	0
	11-19	18-30	5-20	6.6-7.8	0	0	0	0
	19-60	18-30	5-20	7.4-8.4	5-30	0	0-2	0
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
117:								
Wolf Point	0-1	27-40	15-35	6.6-7.3	1-10	0	0-2	0
	1-10	35-50	20-40	6.6-7.8	1-10	0	0-2	0
	10-60	30-60	15-50	7.4-8.4	3-25	1-5	2-8	0-2
118F:								
Lonna	0-2	18-27	15-20	7.4-8.4	5-10	0	0-2	0
	2-11	18-35	10-15	7.4-8.4	5-10	0	0-2	0
	11-34	18-35	10-15	7.9-9.0	5-15	0-2	2-8	1-5
	34-60	10-35	5-15	7.9-9.0	5-15	0	2-8	10-30

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
118F:(cont.)								
Kirby	0-4	10-22	10-15	7.4-8.4	1-5	0	0-2	0
	4-12	10-22	5-10	7.9-8.4	5-15	0	0-2	0
	12-60	1-5	0-0	7.9-8.4	1-5	0	0-2	0
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
119F:								
Patent	0-7	18-27	5-25	7.4-8.4	5-25	0	0	0
	7-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-10
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
121F:								
Maltese	0-7	18-27	15-30	6.1-7.3	0	0-1	0-1	0-1
	7-10	18-27	15-30	6.1-7.3	0	0-1	0-1	0-2
	10-16	40-60	25-45	7.3-8.4	1-3	0-1	0-2	5-10
	16-20	35-50	25-45	7.9-9.0	5-20	0-5	5-15	10-20
	20-33	35-50	25-45	7.9-9.0	3-15	0-5	5-15	10-20
	33-60	15-40	10-30	7.9-9.0	3-15	0-5	5-15	10-20
Lonna	0-2	18-27	15-20	7.4-8.4	5-10	0	0-2	0
	2-11	18-35	10-15	7.4-8.4	5-10	0	0-2	0
	11-34	18-35	10-15	7.9-9.0	5-15	0-2	2-8	1-5
	34-60	10-35	5-15	7.9-9.0	5-15	0	2-8	10-30
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
127:								
Maschetah	0-7	20-27	10-20	7.4-8.4	0-6	0	0	0
	7-48	20-35	10-20	7.9-8.4	20-40	0	0	0
	48-80	20-35	5-15	7.9-8.4	15-40	0	0-4	0
127B:								
Maschetah	0-7	20-27	10-20	7.4-8.4	0-6	0	0	0
	7-48	20-35	10-20	7.9-8.4	20-40	0	0	0
	48-80	20-35	5-15	7.9-8.4	15-40	0	0-4	0
127C:								
Maschetah	0-7	20-27	10-20	7.4-8.4	0-6	0	0	0
	7-48	20-35	10-20	7.9-8.4	20-40	0	0	0
	48-80	20-35	5-15	7.9-8.4	15-40	0	0-4	0
131B:								
Lonna	0-2	18-27	15-20	7.4-8.4	5-10	0	0-2	0
	2-11	18-35	10-15	7.4-8.4	5-10	0	0-2	0
	11-34	18-35	10-15	7.9-9.0	5-15	0-2	2-8	1-5
	34-60	10-35	5-15	7.9-9.0	5-15	0	2-8	10-30

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
131C:								
Lonna	0-2	18-27	15-20	7.4-8.4	5-10	0	0-2	0
	2-11	18-35	10-15	7.4-8.4	5-10	0	0-2	0
	11-34	18-35	10-15	7.9-9.0	5-15	0-2	2-8	1-5
	34-60	10-35	5-15	7.9-9.0	5-15	0	2-8	10-30
132C:								
Patent	0-7	18-27	5-25	7.4-8.4	5-25	0	0	0
	7-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-10
Gerda	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-1
	2-11	35-55	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	11-19	35-55	25-40	7.9-8.4	5-25	0-5	5-15	2-20
	19-29	30-45	20-40	7.9-8.4	5-25	0-5	5-15	5-20
	29-44	30-50	20-40	7.9-8.4	5-25	0-5	5-15	5-25
	44-80	15-27	10-25	7.9-8.4	3-15	0-5	5-15	5-25
Slickspots	0-1	40-60	25-35	7.4-8.4	10-25	0-5	0	0
	1-60	18-50	25-35	7.9-8.4	10-25	0-5	0-10	5-15
138E:								
Scairt	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-6	35-55	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	6-13	35-55	25-45	7.9-8.4	1-5	0-5	5-15	10-25
	13-22	18-50	10-40	7.9-8.4	3-15	0-5	5-15	10-25
	22-28	18-50	10-40	7.9-8.4	5-25	0-5	5-15	10-25
	28-60	10-90	5-40	7.9-8.4	1-15	0-5	5-15	10-25
Maltese	0-7	18-27	15-30	6.1-7.3	0	0-1	0-1	0-1
	7-10	18-27	15-30	6.1-7.3	0	0-1	0-1	0-2
	10-16	40-60	25-45	7.3-8.4	1-3	0-1	0-2	5-10
	16-20	35-50	25-45	7.9-9.0	5-20	0-5	5-15	10-20
	20-33	35-50	25-45	7.9-9.0	3-15	0-5	5-15	10-20
	33-60	15-40	10-30	7.9-9.0	3-15	0-5	5-15	10-20
Boxwell	0-5	18-27	10-20	6.1-7.3	0	0	0	0
	5-14	18-30	10-25	6.6-7.8	0	0	0-2	0
	14-28	18-27	5-20	7.4-8.4	15-30	0	0-4	0
	28-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
145F:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
146B:								
Dooley	0-6	10-18	8-20	6.6-7.8	0	0	0	0
	6-15	20-35	8-23	6.6-7.8	5-20	0	0	0
	15-24	15-25	5-20	6.6-8.4	10-30	0	0	0
	24-60	25-45	10-25	7.4-8.4	5-20	0-2	0-2	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
151B:								
Boxwell	0-5	18-27	10-20	6.1-7.3	0	0	0	0
	5-14	18-30	10-25	6.6-7.8	0	0	0-2	0
	14-28	18-27	5-20	7.4-8.4	15-30	0	0-4	0
	28-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Kremlin	0-11	18-27	10-25	6.1-7.8	0	0	0	0
	11-19	18-30	5-20	6.6-7.8	0	0	0	0
	19-60	18-30	5-20	7.4-8.4	5-30	0	0-2	0
151D:								
Boxwell	0-5	18-27	10-20	6.1-7.3	0	0	0	0
	5-14	18-30	10-25	6.6-7.8	0	0	0-2	0
	14-28	18-27	5-20	7.4-8.4	15-30	0	0-4	0
	28-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4
Kremlin	0-11	18-27	10-25	6.1-7.8	0	0	0	0
	11-19	18-30	5-20	6.6-7.8	0	0	0	0
	19-60	18-30	5-20	7.4-8.4	5-30	0	0-2	0
154F:								
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
Shambo	0-9	18-27	10-25	6.1-7.8	0	0	0	0
	9-13	18-30	10-20	6.6-7.8	0	0	0	0
	13-29	18-30	10-20	6.6-8.4	0-5	0	0	0
	29-48	18-30	10-20	7.4-8.4	5-20	0	0	0
	48-60	18-35	10-15	7.4-8.4	1-15	0	0	0
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
161F:								
Beisigl	0-5	5-10	5-15	6.6-8.4	1-5	0	0-2	0
	5-27	1-8	0-10	7.4-8.4	3-15	0	0-2	0
	27-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
Flasher	0-6	0-10	3-5	6.6-8.4	0	0	0	0
	6-10	0-10	2-5	6.6-8.4	1-10	0	0	0
	10-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-27	10-30	6.1-7.8	0	0	0	0
	2-14	15-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-27	5-20	7.4-8.4	1-5	0	0-4	0
164D:								
Vebar, extremely stony	0-5	10-18	10-15	6.1-7.8	0	0	0	0
	5-26	10-18	10-15	6.1-7.8	0	0	0	0
	26-32	10-18	5-10	7.4-8.4	1-10	0	0	0
	32-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
171:								
Lohler, moderately saline	0-8	40-60	30-50	6.6-8.4	5-15	1-5	8-16	0-2
	8-60	35-60	20-45	7.4-9.0	10-20	1-5	8-16	0-2

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
180:								
Badland	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
183F:								
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
187F:								
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
193B:								
Chanta	0-6	18-27	10-25	6.1-7.3	0	0	0	0
	6-22	18-30	10-25	6.1-7.8	0	0	0	0
	22-26	10-20	5-15	6.6-8.4	1-3	0	0	0
	26-60	1-10	1-5	7.4-8.4	1-15	0	0	0
194F:								
Kirby	0-4	10-22	10-15	7.4-8.4	1-5	0	0-2	0
	4-12	10-22	5-10	7.9-8.4	5-15	0	0-2	0
	12-60	1-5	0-0	7.9-8.4	1-5	0	0-2	0
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
195:								
Havrelon	0-13	27-35	10-20	7.4-7.8	3-10	1-5	8-16	0-2
	13-60	15-35	10-20	7.4-7.8	3-10	1-5	8-16	0-2
199:								
Mckeen	0-2	18-27	5-20	6.6-7.8	1-10	0	0	0
	2-12	18-27	5-20	7.4-8.4	3-25	0	0	0
	12-15	20-50	5-35	6.6-8.4	1-10	0	0	0
	15-60	5-50	2-35	7.4-8.4	3-25	0	0-4	0
201F:								
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
Cabbart	0-3	18-27	10-20	7.4-8.4	1-10	0	0-4	0
	3-18	18-35	10-25	7.4-8.4	10-25	0-5	0-8	0
	18-60	10-35	5-15	7.4-8.4	0-15	0-15	0-8	0-4
202D:								
Boxwell	0-5	18-27	10-20	6.1-7.3	0	0	0	0
	5-14	18-30	10-25	6.6-7.8	0	0	0-2	0
	14-28	18-27	5-20	7.4-8.4	15-30	0	0-4	0
	28-60	5-35	5-20	7.4-8.4	0-15	0-2	0-4	0-4

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
202D:(cont.)								
Scairt	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-6	35-55	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	6-13	35-55	25-45	7.9-8.4	1-5	0-5	5-15	10-25
	13-22	18-50	10-40	7.9-8.4	3-15	0-5	5-15	10-25
	22-28	18-50	10-40	7.9-8.4	5-25	0-5	5-15	10-25
	28-60	10-90	5-40	7.9-8.4	1-15	0-5	5-15	10-25
Maltese	0-7	18-27	15-30	6.1-7.3	0	0-1	0-1	0-1
	7-10	18-27	15-30	6.1-7.3	0	0-1	0-1	0-2
	10-16	40-60	25-45	7.3-8.4	1-3	0-1	0-2	5-10
	16-20	35-50	25-45	7.9-9.0	5-20	0-5	5-15	10-20
	20-33	35-50	25-45	7.9-9.0	3-15	0-5	5-15	10-20
	33-60	15-40	10-30	7.9-9.0	3-15	0-5	5-15	10-20
203D:								
Rhame	0-8	10-18	5-15	6.1-7.3	0	0	0	0
	8-26	10-18	5-10	6.6-7.8	0-3	0	0	0
	26-34	10-18	5-10	6.6-8.4	1-10	0	0	0
	34-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
Kremlin	0-11	18-27	10-25	6.1-7.8	0	0	0	0
	11-19	18-30	5-20	6.6-7.8	0	0	0	0
	19-60	18-30	5-20	7.4-8.4	5-30	0	0-2	0
Maltese	0-7	18-27	15-30	6.1-7.3	0	0-1	0-1	0-1
	7-10	18-27	15-30	6.1-7.3	0	0-1	0-1	0-2
	10-16	40-60	25-45	7.3-8.4	1-3	0-1	0-2	5-10
	16-20	35-50	25-45	7.9-9.0	5-20	0-5	5-15	10-20
	20-33	35-50	25-45	7.9-9.0	3-15	0-5	5-15	10-20
	33-60	15-40	10-30	7.9-9.0	3-15	0-5	5-15	10-20
203F:								
Rhame	0-8	8-18	5-15	6.1-7.3	0	0	0	0
	8-26	8-18	5-10	6.6-7.8	0-3	0	0	0
	26-34	8-18	5-10	6.6-8.4	1-10	0	0	0
	34-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
Scairt	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-6	35-50	25-50	7.4-8.4	1-5	0-1	0-5	5-10
	6-13	35-50	25-45	7.9-8.4	1-5	0-5	5-15	10-25
	13-22	18-50	10-40	7.9-8.4	3-15	0-5	5-15	10-25
	22-28	18-50	10-40	7.9-8.4	5-25	0-5	5-15	10-25
	28-60	10-90	5-40	7.9-8.4	1-15	0-5	5-15	10-25
Kremlin	0-11	18-27	10-25	6.1-7.8	0	0	0	0
	11-19	18-30	5-20	6.6-7.8	0	0	0	0
	19-60	18-30	5-20	7.4-8.4	5-30	0	0-2	0
205:								
Havre, rarely flooded	0-10	18-27	10-15	7.4-8.4	1-10	0	0	0
	10-60	18-35	10-15	7.4-8.4	1-10	0	0-2	0
206:								
Glendive, rarely flooded	0-5	10-18	5-15	6.6-9.0	5-30	0	0-4	0
	5-16	8-18	5-15	7.4-9.0	5-30	0	0-4	0
	16-60	5-18	5-15	7.4-9.0	5-30	0	0-8	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
207:								
Harriet	0-2	12-27	13-23	6.6-8.4	0-5	0	0-2	0
	2-18	35-50	17-26	7.4-9.0	1-15	0-5	4-16	13-25
	18-28	18-40	12-17	7.9-9.0	5-25	0-5	4-16	2-10
	28-38	10-18	5-15	7.9-9.0	3-15	0-5	8-16	2-10
	38-40	23-35	15-30	7.9-9.0	3-15	0-5	8-16	0-5
	40-60	15-45	13-19	7.9-9.0	3-15	0-5	8-16	0-5
211F:								
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
212:								
Trembles	0-9	10-18	5-20	6.6-8.4	3-15	0	0-2	0
	9-59	10-18	5-10	7.4-8.4	5-30	0	0-2	0
	59-80	5-18	0-5	7.4-8.4	5-25	0	0-2	0
213:								
Havrelon, slightly wet	0-13	18-27	10-20	7.4-7.9	1-5	0	0	0
	13-60	15-35	10-20	7.4-7.9	1-5	0-1	2-4	0-1
214:								
Channel	---	---	---	---	---	---	---	---
Korchea, wooded	0-6	10-35	10-25	6.6-7.8	0-5	0	0	0
	6-60	18-35	10-25	7.4-8.4	5-15	0	0-2	0
217:								
Wolf Point, wooded	0-1	27-40	15-35	6.6-7.3	1-10	0	0-2	0
	1-10	35-50	20-40	6.6-7.8	1-10	0	0-2	0
	10-60	30-60	15-50	7.4-8.4	3-25	1-5	2-8	0-2
218F:								
Cherry	0-3	18-27	10-20	6.6-7.8	1-3	0	0	0
	3-33	18-35	10-25	7.9-8.4	3-15	0	0	0
	33-60	18-50	10-30	7.9-8.4	3-15	0	0-8	0
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Brandenburg	0-4	10-25	10-25	6.6-7.8	1-5	0	0	0
	4-10	5-25	0-20	6.6-8.4	3-15	0	0	0
	10-60	1-5	0-3	6.6-8.4	3-15	0	0	0
227:								
Haydraw	0-6	18-27	10-25	7.4-8.4	5-25	0	0	0
	6-58	18-35	10-20	7.9-8.4	15-40	0	0	0
	58-80	18-35	5-20	7.9-8.4	1-15	0	0-4	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
227B:								
Haydraw	0-6	18-27	10-25	7.4-8.4	5-25	0	0	0
	6-58	18-35	10-20	7.9-8.4	15-40	0	0	0
	58-80	18-35	5-20	7.9-8.4	1-15	0	0-4	0
231C:								
Patent	0-7	18-27	5-25	7.4-8.4	5-25	0	0	0
	7-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-10
Gullied land	0-60	10-40	---	6.1-9.0	0	0	2-16	2-20
Glendive	0-5	10-18	5-15	6.6-9.0	5-30	0	0-4	0
	5-16	8-18	5-15	7.4-9.0	5-30	0	0-4	0
	16-60	5-18	5-15	7.4-9.0	5-30	0	0-8	0
232C:								
Lambert	0-5	18-27	5-25	7.4-8.4	5-25	0	0	0
	5-36	18-35	5-25	7.9-8.4	5-30	0	0-2	0
	36-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-10
Slickspots	0-1	40-60	25-35	7.4-8.4	10-25	0-5	0	0
	1-60	18-50	25-35	7.9-8.4	10-25	0-5	0-10	5-15
Rhoades	0-3	18-27	20-35	6.1-7.9	0	0-1	0-1	0-1
	3-8	35-50	20-45	7.4-8.4	0-5	0-1	0-5	5-10
	8-14	35-50	20-45	7.9-8.4	3-15	0-5	5-15	2-20
	14-46	20-50	15-35	7.9-8.4	3-15	0-5	5-15	5-25
	46-60	20-45	15-35	7.9-8.4	5-25	0-5	5-15	5-25
238B:								
Janesburg	0-8	18-27	15-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	15-27	10-25	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-50	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	10-55	7.9-8.4	0-5	0-5	5-15	10-20
Dogtooth	0-2	18-27	15-30	6.1-7.9	0	0-1	0-1	0-5
	2-8	35-50	20-50	7.4-8.4	1-15	0-1	0-5	5-10
	8-13	35-50	20-50	7.9-8.4	3-15	0-5	5-15	10-25
	13-21	18-50	10-55	7.9-8.4	3-15	0-5	5-15	10-25
	21-60	10-90	5-40	7.9-8.4	0-15	0-5	5-15	10-25
239D:								
Vebar	0-5	10-18	10-15	6.1-7.8	0	0	0	0
	5-26	10-18	10-15	6.1-7.8	0	0	0	0
	26-32	10-18	5-10	7.4-8.4	1-10	0	0	0
	32-60	1-10	0-10	7.4-8.4	0-10	0-1	0-2	0
Janesburg	0-8	10-18	10-25	6.1-7.3	0	0-1	0-1	0-1
	8-10	8-18	10-25	6.1-7.3	0	0-1	0-1	0-1
	10-21	35-55	25-45	7.3-8.4	0-3	0-1	0-5	5-10
	21-26	18-45	10-40	7.9-8.4	3-15	0-5	5-15	10-20
	26-60	10-90	5-40	7.9-8.4	3-15	0-5	5-15	10-20
242F:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
242F:(cont.)								
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
287F:								
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
299:								
Minnewaukan	0-3	8-18	2-12	6.6-7.8	0-2	0	2-4	0-1
	3-5	1-10	2-12	6.6-7.8	0-2	0	2-4	0-1
	5-60	1-10	2-7	7.4-8.4	3-20	0	2-4	0-5
Banks	0-4	3-10	1-6	6.6-7.8	1-3	0	0	0
	4-30	1-10	0-6	7.4-8.4	1-5	0-2	0	0
	30-60	1-10	0-6	7.4-8.4	1-5	0-2	0	0
Riverwash	0-6	1-5	---	6.1-7.8	---	---	0	---
	6-60	1-10	---	6.1-7.8	---	---	0	---
317:								
Lallie	0-2	27-50	20-30	6.6-8.4	5-25	0-2	0-4	0-2
	2-24	27-45	20-30	7.4-8.4	10-30	0-2	0-4	0-2
	24-32	27-50	20-30	7.4-8.4	5-30	0-2	0-8	0-2
	32-60	27-50	20-30	7.4-8.4	5-25	1-3	2-8	1-5
331B:								
Cherry	0-3	18-27	10-20	6.6-7.8	1-3	0	0	0
	3-33	18-35	10-25	7.9-8.4	3-15	0	0	0
	33-60	18-50	10-30	7.9-8.4	3-15	0	0-8	0
Gullied land	0-60	10-40	---	6.1-9.0	0	0	2-16	2-20
Havrelon	0-13	18-27	10-20	7.4-7.9	1-5	0	0	0
	13-60	15-35	10-20	7.4-7.9	1-5	0-1	2-4	0-1
340B:								
Niobell	0-6	10-27	10-25	5.6-7.3	0	0	0	0
	6-9	10-27	10-25	5.6-7.3	0	0	0	0
	9-19	35-50	20-40	6.5-8.4	0-5	0-2	2-4	1-15
	19-29	35-45	15-25	7.9-9.0	10-20	0-3	2-4	5-10
	29-60	18-35	10-15	7.9-9.0	10-20	0-3	2-8	5-10

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
340B:(cont.)								
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
341B:								
Noonan	0-6	18-27	10-25	5.6-7.3	0	0	0	0
	6-9	27-40	10-20	6.6-9.0	0-3	0	0-4	5-16
	9-12	27-40	10-20	6.6-9.0	0-3	0	0-4	5-16
	12-20	27-35	10-20	7.4-9.0	10-30	0-2	5-15	5-10
	20-28	18-35	10-15	7.4-9.0	10-30	0-2	5-15	5-10
	28-60	18-35	10-15	7.4-9.0	10-25	0-3	5-15	5-10
Niobell	0-6	10-27	10-25	5.6-7.3	0	0	0	0
	6-9	10-27	10-25	5.6-7.3	0	0	0	0
	9-19	35-50	20-40	6.5-8.4	0-5	0-2	2-4	1-15
	19-29	35-45	15-25	7.9-9.0	10-20	0-3	2-4	5-10
	29-60	18-35	10-15	7.9-9.0	10-20	0-3	2-8	5-10
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
341C:								
Noonan	0-6	18-27	10-25	5.6-7.3	0	0	0	0
	6-9	27-40	10-20	6.6-9.0	0-3	0	0-4	5-16
	9-12	27-40	10-20	6.6-9.0	0-3	0	0-4	5-16
	12-20	27-35	10-20	7.4-9.0	10-30	0-2	5-15	5-10
	20-28	18-35	10-15	7.4-9.0	10-30	0-2	5-15	5-10
	28-60	18-35	10-15	7.4-9.0	10-25	0-3	5-15	5-10
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
403F:								
Rhame	0-8	10-18	5-15	6.1-7.3	0	0	0	0
	8-26	10-18	5-10	6.6-7.8	0-3	0	0	0
	26-34	10-18	5-10	6.6-8.4	1-10	0	0	0
	34-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
Arikara	0-1	0-15	65-100	6.1-7.3	---	---	---	---
	1-2	18-35	10-30	6.1-7.8	0	0	0	0
	2-14	18-35	10-25	6.1-7.8	0	0	0	0
	14-39	15-35	10-25	7.4-8.4	1-10	0	0-2	0
	39-60	15-35	5-20	7.4-8.4	1-5	0	0-4	0
Fleak	0-3	3-10	1-10	6.6-7.8	0	0	0	0
	3-17	1-10	1-10	6.6-8.4	1-10	0	0	0
	17-60	1-10	0-5	7.4-8.4	1-10	0-1	0-2	0
404F:								
Badland, outcrop	0-60	10-60	5-40	6.1-9.0	2-15	0-3	2-16	2-30

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
404F:(cont.)								
Lambert	0-5	18-27	5-25	7.4-8.4	5-25	0	0	0
	5-36	18-35	5-25	7.9-8.4	5-30	0	0-2	0
	36-60	15-35	5-25	7.9-8.4	5-30	0	0-4	0-10
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
406:								
Glendive, wooded	0-5	10-18	5-15	6.6-9.0	5-30	0	0-4	0
	5-16	8-18	5-15	7.4-9.0	5-30	0	0-4	0
	16-60	5-18	5-15	7.4-9.0	5-30	0	0-8	0
408B:								
Hanly, wooded	0-5	10-18	5-15	6.6-8.4	0	0	0	0
	5-60	1-10	1-5	6.6-8.4	1-5	0	0-2	0
410:								
Riverwash	0-6	1-5	---	6.1-7.8	---	---	0	---
	6-60	1-10	---	6.1-7.8	---	---	0	---
411B:								
Lambert	0-5	18-27	15-20	7.4-8.4	0	0	0	0
	5-36	18-35	15-20	7.9-8.4	5-10	0	0-2	0
	36-60	15-35	10-15	7.9-8.4	5-10	0	0-4	0-10
412E:								
Lambert	0-5	18-27	15-20	7.4-8.4	0	0	0	0
	5-36	18-35	15-20	7.9-8.4	5-10	0	0-2	0
	36-60	15-35	10-15	7.9-8.4	5-10	0	0-4	0-10
Brandenburg	0-4	10-25	10-25	6.6-7.8	1-5	0	0	0
	4-10	5-25	0-20	6.6-8.4	3-15	0	0	0
	10-60	1-5	0-3	6.6-8.4	3-15	0	0	0
442F:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
460C:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
460C:(cont.)								
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
460D:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Cabba	0-3	18-27	10-15	6.6-8.4	2-5	0	0-2	0
	3-15	18-35	10-20	7.4-8.4	1-15	0	1-2	0
	15-60	10-35	5-20	7.4-8.4	0-15	0-5	2-4	0-4
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
470C:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Tally	0-6	10-18	5-20	6.1-7.8	0	0	0	0
	6-32	10-18	5-10	6.6-8.4	0	0	0	0
	32-60	5-18	5-10	7.4-8.4	5-15	0	0	0
Williams	0-6	15-27	15-30	6.6-7.8	0	0	0	0
	6-10	24-35	10-30	6.6-7.8	0-5	0	0	0
	10-15	24-35	10-30	6.6-7.8	0-5	0	0	0
	15-24	24-35	10-30	7.4-8.4	15-30	0	0	0
	24-36	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
	36-60	20-35	10-25	7.4-8.4	5-20	0-2	0-2	0-5
470D:								
Zahl	0-5	18-27	10-20	6.6-8.4	1-10	0	0	0
	5-20	20-30	10-15	7.4-8.4	15-35	0-2	0	0
	20-60	20-30	10-15	7.4-8.4	5-25	0-2	0-2	0-1
Beisigl	0-5	3-10	5-15	6.6-8.4	1-5	0	0	0
	5-27	1-10	0-10	7.4-8.4	3-15	0	0-1	0
	27-60	1-10	0-5	7.4-8.4	0-10	0-1	0-2	0
Tally	0-6	10-18	5-20	6.1-7.8	0	0	0	0
	6-32	10-18	5-10	6.6-8.4	0	0	0	0
	32-60	5-18	5-10	7.4-8.4	5-15	0	0	0
490:								
Riverwash	0-6	1-5	---	6.1-7.8	---	---	0	---
	6-60	1-10	---	6.1-7.8	---	---	0	---
496:								
Pits, gravel and sand, low precipitation	0-6	1-10	2-12	6.6-8.4	0-3	0	0	0
	6-60	1-15	1-10	6.6-8.4	5-20	0	0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
M-W:								
Miscellaneous water--	---	---	---	---	---	---	---	---
W:								
Water----------	---	---	---	---	---	---	---	---

Water Features

(Dashes (---) indicate that an assignment has not been made. Depths of layers are in feet.)

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
2:									
Heil	D								
		January	1.5-3.5	> 6.0	---	---	None	---	---
		February	1.5-3.5	> 6.0	---	---	None	---	---
		March	0.0-1.5	> 6.0	0.5-1.5	Long	Occasional	---	---
		April	0.0-1.5	> 6.0	0.5-1.5	Long	Occasional	---	---
		May	0.0-1.5	> 6.0	0.0-1.0	Long	Occasional	---	---
		June	0.0-1.5	> 6.0	0.0-0.5	Long	Rare	---	---
		July	1.5-3.5	> 6.0	---	---	None	---	---
		August	3.5-5.0	> 6.0	---	---	None	---	---
		September	3.5-5.0	> 6.0	---	---	None	---	---
		October	1.5-3.5	> 6.0	---	---	None	---	---
		November	1.5-3.5	> 6.0	---	---	None	---	---
		December	1.5-3.5	> 6.0	---	---	None	---	---
3:									
Dimmick	D								
		January	1.0-1.5	> 6.0	---	---	None	---	---
		February	1.0-1.5	> 6.0	---	---	None	---	---
		March	0.0	> 6.0	0.0-1.0	Very long	Frequent	---	---
		April	0.0	> 6.0	0.0-1.0	Very long	Frequent	---	---
		May	0.0	> 6.0	0.0-1.0	Very long	Frequent	---	---
		June	0.0-1.0	> 6.0	0.0-1.0	Long	Occasional	---	---
		July	1.0-1.5	> 6.0	---	---	None	---	---
		August	1.5-3.5	> 6.0	---	---	None	---	---
		September	1.5-3.5	> 6.0	---	---	None	---	---
		October	1.0-1.5	> 6.0	---	---	None	---	---
		November	1.0-1.5	> 6.0	---	---	None	---	---
		December	1.0-1.5	> 6.0	---	---	None	---	---
5:									
Tonka	C/D								
		January	1.5-3.5	> 6.0	---	---	None	---	---
		February	1.5-3.5	> 6.0	---	---	None	---	---
		March	0.0	1.0-1.5	0.0-1.0	Long	Frequent	---	---
			1.5-2.0	> 6.0					
		April	0.0	1.0-1.5	0.0-1.0	Long	Frequent	---	---
			1.5-2.0	> 6.0					
		May	0.0-1.5	> 6.0	0.0-1.0	Long	Frequent	---	---
		June	0.0-1.5	> 6.0	0.0-1.0	Long	Frequent	---	---
		July	1.5-3.5	> 6.0	---	---	None	---	---
		August	3.5-5.0	> 6.0	---	---	None	---	---
		September	1.5-3.5	> 6.0	---	---	None	---	---
		October	1.5-3.5	> 6.0	---	---	None	---	---
		November	1.5-3.5	> 6.0	---	---	None	---	---
		December	1.5-3.5	> 6.0	---	---	None	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
5:(cont.)									
Hamerly	C								
		January	3.5-5.0	> 6.0	---	---	---	---	---
		February	3.5-5.0	> 6.0	---	---	---	---	---
		March	3.5-5.0	> 6.0	---	---	---	---	---
		April	1.5-3.5	> 6.0	---	---	---	---	---
		May	1.5-3.5	> 6.0	---	---	---	---	---
		June	1.5-3.5	> 6.0	---	---	---	---	---
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
		November	3.5-5.0	> 6.0	---	---	---	---	---
		December	3.5-5.0	> 6.0	---	---	---	---	---
7:									
Harriet	D								
		January	1.5-3.5	> 6.0	---	---	---	---	---
		February	1.5-3.5	> 6.0	---	---	---	---	---
		March	0.0-1.5	> 6.0	---	---	---	Brief	Occasional
		April	0.0-1.5	> 6.0	---	---	---	Brief	Occasional
		May	0.0-1.5	> 6.0	---	---	---	Brief	Occasional
		June	0.0-1.5	> 6.0	---	---	---	Very brief	Occasional
		July	1.5-3.5	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	1.5-3.5	> 6.0	---	---	---	---	---
		November	1.5-3.5	> 6.0	---	---	---	---	---
		December	1.5-3.5	> 6.0	---	---	---	---	---
9:									
Grano	D								
		January	0.0-1.5	> 6.0	---	---	None	---	---
		February	0.0-1.5	> 6.0	---	---	None	---	---
		March	0.0-1.0	> 6.0	0.0-1.0	Very long	Frequent	---	---
		April	0.0-1.0	> 6.0	0.0-1.0	Very long	Frequent	---	---
		May	0.0-1.0	> 6.0	0.0-1.0	Long	Occasional	---	---
		June	0.0-1.0	> 6.0	0.0-1.0	Long	Occasional	---	---
		July	0.0-1.0	> 6.0	---	---	None	---	---
		August	0.0-1.5	> 6.0	---	---	None	---	---
		September	0.0-1.5	> 6.0	---	---	None	---	---
		October	0.0-1.5	> 6.0	---	---	None	---	---
		November	0.0-1.5	> 6.0	---	---	None	---	---
		December	0.0-1.5	> 6.0	---	---	None	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
10:									
Banks	A								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
10D:									
Seroco	A								
		All months	---	---	---	---	None	---	None
Lohler	D								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
11B:									
Patent	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
12:									
Trembles	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
13:									
Havrelon	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
14:									
Channel	---								
		March	---	---	---	---	---	Long	Very frequent
		April	3.5-5.0	> 6.0	---	---	---	Brief	Very frequent
		May	3.5-5.0	> 6.0	---	---	---	Brief	Very frequent
		June	3.5-5.0	> 6.0	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
Korchea	B								
		March	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
15:									
Korchea	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
16:									
Ridgelawn	B								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
17:									
Lohler	C								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
19:									
Hoffmanville	D								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
20:									
Scorio	D								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
21B:									
Tally	B								
		All months	---	---	---	---	---	---	---
Parshall	B								
		All months	---	---	---	---	---	---	---
21C:									
Tally	B								
		All months	---	---	---	---	---	---	---
Parshall	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
22:									
Velva	B								
		March	---	---	---	---	None	Very brief	Rare
		April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
23B:									
Lihen	A								
		All months	---	---	---	---	---	---	---
Parshall	B								
		All months	---	---	---	---	---	---	---
23D:									
Beisigl	A								
		All months	---	---	---	---	---	---	---
Telfer	A								
		All months	---	---	---	---	---	---	---
24:									
Arnegard	B								
		All months	---	---	---	---	---	---	---
25:									
Farnuf	B								
		All months	---	---	---	---	---	---	---
25B:									
Farnuf	B								
		All months	---	---	---	---	---	---	---
25C:									
Farnuf	B								
		All months	---	---	---	---	---	---	---
26:									
Tansem	B								
		All months	---	---	---	---	---	---	---
Roseglen	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
26B:									
Tansem	B	All months	---	---	---	---	---	---	---
Roseglen	B	All months	---	---	---	---	---	---	---
27:									
Golva	B	All months	---	---	---	---	---	---	---
27B:									
Golva	B	All months	---	---	---	---	---	---	---
27C:									
Golva	B	All months	---	---	---	---	---	---	---
29:									
Savage	C	All months	---	---	---	---	---	---	---
29B:									
Savage	C	All months	---	---	---	---	---	---	---
29C:									
Savage	C	All months	---	---	---	---	---	---	---
30:									
Lawther	D	All months	---	---	---	---	---	---	---
31B:									
Cherry	B	All months	---	---	---	---	---	---	---
31C:									
Cherry	B	All months	---	---	---	---	---	---	---
32F:									
Cherry	B	All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
32F:(cont)									
Cabba	D								
		All months	---	---	---	---	---	---	---
33:									
Belfield	C								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
Grail	C								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
33B:									
Belfield	C								
		April	4.0-6.0	> 6.0	---	---	---	---	---
		May	4.0-6.0	> 6.0	---	---	---	---	---
		June	4.0-6.0	> 6.0	---	---	---	---	---
Savage	C								
		All months	---	---	---	---	---	---	---
34B:									
Daglum	D								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
Belfield	C								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
36B:									
Rhoades	D								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
Daglum	D								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
38B:									
Dogtooth	D								
		All months	---	---	---	---	---	---	---
Janesburg	D								
		All months	---	---	---	---	---	---	---
38F:									
Dogtooth	D								
		All months	---	---	---	---	---	---	---
Janesburg	D								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
40B:									
Desart	C								
		All months	---	---	---	---	---	---	---
Janesburg	D								
		All months	---	---	---	---	---	---	---
Ekalaka	D								
		All months	---	---	---	---	---	---	---
41:									
Williams	B								
		All months	---	---	---	---	---	---	---
Bowbells	B								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
41B:									
Williams	B								
		All months	---	---	---	---	---	---	---
Bowbells	B								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
42B:									
Williams	B								
		All months	---	---	---	---	---	---	---
Zahl	B								
		All months	---	---	---	---	---	---	---
42C:									
Williams	B								
		All months	---	---	---	---	---	---	---
43C:									
Williams	B								
		All months	---	---	---	---	---	---	---
Zahl	B								
		All months	---	---	---	---	---	---	---
44D:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
44E:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
45F:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
Maschetah	B								
		All months	---	---	---	---	---	---	---
46B:									
Dooley	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
46B:(cont.)									
Zahl	B								
		All months	---	---	---	---	---	---	---
46C:									
Dooley	B								
		All months	---	---	---	---	---	---	---
Zahl	B								
		All months	---	---	---	---	---	---	---
46D:									
Dooley	B								
		All months	---	---	---	---	---	---	---
Zahl	B								
		All months	---	---	---	---	---	---	---
48:									
Temvik	B								
		All months	---	---	---	---	---	---	---
Wilton	B								
		All months	---	---	---	---	---	---	---
49:									
Temvik	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
49B:									
Temvik	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
50B:									
Temvik	B								
		All months	---	---	---	---	---	---	---
Zahl	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
51B:									
Amor	B								
		All months	---	---	---	---	---	---	---
Shambo	B								
		All months	---	---	---	---	---	---	---
51C:									
Amor	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
51D:									
Amor	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
52B:									
Reeder	B								
		All months	---	---	---	---	---	---	---
Farnuf	B								
		All months	---	---	---	---	---	---	---
52C:									
Reeder	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
53B:									
Chama	B								
		All months	---	---	---	---	---	---	---
Sen	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
53C:									
Chama	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
Sen	B								
		All months	---	---	---	---	---	---	---
53D:									
Cabba	D								
		All months	---	---	---	---	---	---	---
Chama	B								
		All months	---	---	---	---	---	---	---
Sen	B								
		All months	---	---	---	---	---	---	---
54F:									
Cabba	D								
		All months	---	---	---	---	---	---	---
Sen	B								
		All months	---	---	---	---	---	---	---
Chama	B								
		All months	---	---	---	---	---	---	---
55B:									
Sen	B								
		All months	---	---	---	---	---	---	---
Janesburg	D								
		All months	---	---	---	---	---	---	---
56B:									
Lefor	C								
		All months	---	---	---	---	---	---	---
56C:									
Lefor	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
61D:									
Beisigl	A								
		All months	---	---	---	---	---	---	---
Flasher	D								
		All months	---	---	---	---	---	---	---
61F:									
Beisigl	A								
		All months	---	---	---	---	---	---	---
Flasher	C								
		All months	---	---	---	---	---	---	---
Tally	B								
		All months	---	---	---	---	---	---	---
62F:									
Flasher	D								
		All months	---	---	---	---	---	---	---
Rock outcrop	D								
		All months	---	---	---	---	---	---	---
Vebar	B								
		All months	---	---	---	---	---	---	---
63B:									
Vebar	B								
		All months	---	---	---	---	---	---	---
Flasher	D								
		All months	---	---	---	---	---	---	---
63C:									
Vebar	B								
		All months	---	---	---	---	---	---	---
Flasher	D								
		All months	---	---	---	---	---	---	---
63D:									
Vebar	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
63D:(cont.)									
Flasher	D								
		All months	---	---	---	---	---	---	---
Tally	B								
		All months	---	---	---	---	---	---	---
66B:									
Manning	B								
		All months	---	---	---	---	---	---	---
70B:									
Regent	C								
		All months	---	---	---	---	---	---	---
Savage	C								
		All months	---	---	---	---	---	---	---
70C:									
Regent	C								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
71B:									
Regent	C								
		All months	---	---	---	---	---	---	---
Janesburg	D								
		All months	---	---	---	---	---	---	---
71C:									
Regent	C								
		All months	---	---	---	---	---	---	---
Janesburg	D								
		All months	---	---	---	---	---	---	---
72B:									
Moreau	D								
		All months	---	---	---	---	---	---	---
72C:									
Moreau	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
72C:(cont.)									
Wayden	D								
		All months	---	---	---	---	---	---	---
72D:									
Moreau	D								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
80:									
Badland, high precipitation	D								
		All months	---	---	---	---	---	---	---
83F:									
Cabba	D								
		All months	---	---	---	---	---	---	---
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
84F:									
Cabba	D								
		All months	---	---	---	---	---	---	---
Chama	B								
		All months	---	---	---	---	---	---	---
Havrelon	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
88D:									
Brandenburg	A								
		All months	---	---	---	---	---	---	---
Searing	B								
		All months	---	---	---	---	---	---	---
Dogtooth	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
88F:									
Brandenburg	A	All months	---	---	---	---	---	---	---
Cabba	D	All months	---	---	---	---	---	---	---
Dogtooth	D	All months	---	---	---	---	---	---	---
89F:									
Brandenburg	A	All months	---	---	---	---	---	---	---
Cabba	D	All months	---	---	---	---	---	---	---
Badland, outcrop	D	All months	---	---	---	---	---	---	---
90E:									
Manning	B	All months	---	---	---	---	---	---	---
Schaller	A	All months	---	---	---	---	---	---	---
Wabek	A	All months	---	---	---	---	---	---	---
91F:									
Wabek	A	All months	---	---	---	---	---	---	---
Zahl	B	All months	---	---	---	---	---	---	---
93B:									
Lehr	B	All months	---	---	---	---	---	---	---
Stady	B	All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
94B:									
Searing	B								
		All months	---	---	---	---	---	---	---
Ringling	A								
		All months	---	---	---	---	---	---	---
95:									
Havrelon	B								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
96:									
Pits, gravel and sand	A								
		All months	---	---	---	---	---	---	---
98F:									
Tinsley	A								
		All months	---	---	---	---	---	---	---
Chanta	B								
		All months	---	---	---	---	---	---	---
99:									
Mckeen	D								
		January	0.0-1.0	> 6.0	---	---	---	---	---
		February	0.0-1.0	> 6.0	---	---	---	---	---
		March	0.0-0.5	> 6.0	---	---	---	Long	Frequent
		April	0.0-0.5	> 6.0	---	---	---	Long	Frequent
		May	0.0-0.5	> 6.0	---	---	---	Long	Frequent
		June	0.0-0.5	> 6.0	---	---	---	Long	Frequent
		July	0.0-0.5	> 6.0	---	---	---	---	---
		August	0.0-1.0	> 6.0	---	---	---	---	---
		September	0.0-1.0	> 6.0	---	---	---	---	---
		October	0.0-1.0	> 6.0	---	---	---	---	---
		November	0.0-1.0	> 6.0	---	---	---	---	---
		December	0.0-1.0	> 6.0	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
100F:									
Boxwell	B								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---
101F:									
Cabbart	D								
		All months	---	---	---	---	---	---	---
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
102B:									
Kremlin	B								
		All months	---	---	---	---	---	---	---
Ethridge	C								
		All months	---	---	---	---	---	---	---
Gerda	D								
		All months	---	---	---	---	---	---	---
103B:									
Chinook	B								
		All months	---	---	---	---	---	---	---
Rhame	B								
		All months	---	---	---	---	---	---	---
103D:									
Rhame	B								
		All months	---	---	---	---	---	---	---
Chinook	B								
		All months	---	---	---	---	---	---	---
103F:									
Rhame	B								
		All months	---	---	---	---	---	---	---
Fleak	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
104E:									
Badland, outcrop----------	D								
		All months	---	---	---	---	---	---	---
Patent----------	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
105:									
Havre----------	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
106:									
Glendive----------	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
107:									
Kremlin----------	B								
		All months	---	---	---	---	---	---	---
108B:									
Hanly----------	A								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
109:									
Havre, wooded----------	B								
		March	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		April	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		May	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		June	4.0-6.0	> 6.0	---	---	---	Brief	Occasional

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
110B:									
Maltese	D								
		All months	---	---	---	---	---	---	---
Gerda	D								
		All months	---	---	---	---	---	---	---
111D:									
Gerda	D								
		All months	---	---	---	---	---	---	---
Kirby	A								
		All months	---	---	---	---	---	---	---
111F:									
Kirby	A								
		All months	---	---	---	---	---	---	---
Scairt	D								
		All months	---	---	---	---	---	---	---
112F:									
Kirby	A								
		All months	---	---	---	---	---	---	---
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
Patent	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
113F:									
Lonna	B								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
114:									
Channel	---								
		March	---	---	---	---	---	Long	Very frequent
		April	3.5-5.0	> 6.0	---	---	---	Brief	Very frequent
		May	3.5-5.0	> 6.0	---	---	---	Brief	Very frequent
		June	3.5-5.0	> 6.0	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
Glendive	B								
		March	---	---	---	---	---	Brief	Rare
		April	---	---	---	---	---	Brief	Rare
		May	---	---	---	---	---	Brief	Rare
		June	---	---	---	---	---	Brief	Rare
Havre	B								
		March	---	---	---	---	---	Brief	Rare
		April	---	---	---	---	---	Brief	Rare
		May	---	---	---	---	---	Brief	Rare
		June	---	---	---	---	---	Brief	Rare
115F:									
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---
116F:									
Kremlin	B								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
117:									
Wolf Point	C								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
118F:									
Lonna	B								
		All months	---	---	---	---	---	---	---
Kirby	A								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---
119F:									
Patent	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---
121F:									
Maltese	D								
		All months	---	---	---	---	---	---	---
Lonna	B								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
127:									
Maschetah	B								
		All months	---	---	---	---	---	---	---
127B:									
Maschetah	B								
		All months	---	---	---	---	---	---	---
127C:									
Maschetah	B								
		All months	---	---	---	---	---	---	---
131B:									
Lonna	B								
		All months	---	---	---	---	---	---	---
131C:									
Lonna	B								
		All months	---	---	---	---	---	---	---
132C:									
Patent	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
Gerda	D								
		All months	---	---	---	---	---	---	---
Slickspots	D								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
138E:									
Scairt	D	All months	---	---	---	---	---	---	---
Maltese	D	All months	---	---	---	---	---	---	---
Boxwell	B	All months	---	---	---	---	---	---	---
145F:									
Zahl	B	All months	---	---	---	---	---	---	---
Cabba	D	All months	---	---	---	---	---	---	---
Arikara	B	All months	---	---	---	---	---	---	---
146B:									
Dooley	B	All months	---	---	---	---	---	---	---
151B:									
Boxwell	B	All months	---	---	---	---	---	---	---
Kremlin	B	All months	---	---	---	---	---	---	---
151D:									
Boxwell	B	All months	---	---	---	---	---	---	---
Kremlin	B	All months	---	---	---	---	---	---	---
154F:									
Arikara	B	All months	---	---	---	---	---	---	---
Shambo	B	All months	---	---	---	---	---	---	---
Cabba	D	All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
161F:									
Beisigl	A								
		All months	---	---	---	---	---	---	---
Flasher	D								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---
164D:									
Vebar, extremely stony	B								
		All months	---	---	---	---	---	---	---
171:									
Lohler, moderately saline-	D								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
180:									
Badland	D								
		All months	---	---	---	---	---	---	---
183F:									
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
187F:									
Arikara	B								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---
193B:									
Chanta	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
194F:									
Kirby	A								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
195:									
Havrelon	B								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
199:									
Mckeen	D								
		January	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		February	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		March	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		April	0.0	> 6.0	1.0-3.0	Very long	Frequent	Very long	Frequent
		May	0.0	> 6.0	1.0-3.0	Very long	Frequent	Very long	Frequent
		June	0.0	> 6.0	1.0-3.0	Very long	Frequent	Very long	Frequent
		July	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		August	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		September	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		October	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		November	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
		December	0.0	> 6.0	1.0-3.0	Very long	Frequent	---	---
201F:									
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
Cabbart	D								
		All months	---	---	---	---	---	---	---
202D:									
Boxwell	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
202D:(cont.)									
Scairt	D								
		All months	---	---	---	---	---	---	---
Maltese	D								
		All months	---	---	---	---	---	---	---
203D:									
Rhame	B								
		All months	---	---	---	---	---	---	---
Kremlin	B								
		All months	---	---	---	---	---	---	---
Maltese	D								
		All months	---	---	---	---	---	---	---
203F:									
Rhame	B								
		All months	---	---	---	---	---	---	---
Scairt	D								
		All months	---	---	---	---	---	---	---
Kremlin	B								
		All months	---	---	---	---	---	---	---
205:									
Havre, rarely flooded	B								
		March	---	---	---	---	---	Brief	Rare
		April	---	---	---	---	---	Brief	Rare
		May	---	---	---	---	---	Brief	Rare
		June	---	---	---	---	---	Brief	Rare
206:									
Glendive, rarely flooded	B								
		March	---	---	---	---	---	Brief	Rare
		April	---	---	---	---	---	Brief	Rare
		May	---	---	---	---	---	Brief	Rare
		June	---	---	---	---	---	Brief	Rare

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
207:									
Harriet	D								
		January	0.0-1.0	> 6.0	---	---	---	---	---
		February	0.0-1.0	> 6.0	---	---	---	---	---
		March	0.0-1.0	> 6.0	---	---	---	---	---
		April	0.0-1.0	> 6.0	---	---	---	Long	Occasional
		May	0.0-1.0	> 6.0	---	---	---	Long	Occasional
		June	0.0-1.0	> 6.0	---	---	---	Long	Occasional
		September	0.0-1.0	> 6.0	---	---	---	---	---
		October	0.0-1.0	> 6.0	---	---	---	---	---
		November	0.0-1.0	> 6.0	---	---	---	---	---
		December	0.0-1.0	> 6.0	---	---	---	---	---
211F:									
Cabba	D								
		All months	---	---	---	---	---	---	---
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---
212:									
Trembles	B								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---
213:									
Havrelon, slightly wet	B								
		March	---	---	---	---	---	Brief	Occasional
		April	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		May	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		June	3.5-5.0	> 6.0	---	---	---	Brief	Occasional
		July	3.5-5.0	> 6.0	---	---	---	---	---
		August	3.5-5.0	> 6.0	---	---	---	---	---
		September	3.5-5.0	> 6.0	---	---	---	---	---
		October	3.5-5.0	> 6.0	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
214:									
Channel	---								
		March	---	---	---	---	---	Long	Very frequent
		April	3.5-5.0	> 6.0	---	---	---	Brief	Very frequent
		May	3.5-5.0	> 6.0	---	---	---	Brief	Very frequent
		June	3.5-5.0	> 6.0	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
Korchea, wooded	B								
		March	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
217:									
Wolf Point, wooded	C								
		March	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		April	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		May	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		June	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
218F:									
Cherry	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
Brandenburg	A								
		All months	---	---	---	---	---	---	---
227:									
Haydraw	B								
		All months	---	---	---	---	---	---	---
227B:									
Haydraw	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
231C:									
Patent	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
Gullied land	D								
		All months	---	---	---	---	---	---	---
Glendive	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
232C:									
Lambert	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
Slickspots	D								
		January	---	---	---	---	---	---	---
		February	---	---	---	---	---	---	---
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
		December	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
232C:(cont.)									
Rhoades	D								
		April	4.0-6.0	> 6.0	---	---	---	---	---
		May	4.0-6.0	> 6.0	---	---	---	---	---
		June	4.0-6.0	> 6.0	---	---	---	---	---
238B:									
Janesburg	D								
		All months	---	---	---	---	---	---	---
Dogtooth	D								
		All months	---	---	---	---	---	---	---
239D:									
Vebar	B								
		All months	---	---	---	---	---	---	---
Janesburg	D								
		All months	---	---	---	---	---	---	---
242F:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---
287F:									
Arikara	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
299:									
Minnewaukan	D								
		January	0.5-1.5	> 6.0	---	---	None	---	---
		February	0.5-1.5	> 6.0	---	---	None	---	---
		March	0.0	> 6.0	0.0-0.5	Very long	Frequent	---	---
		April	0.0	> 6.0	0.0-0.5	Very long	Frequent	Long	Frequent
		May	0.0	> 6.0	0.0-0.5	Very long	Frequent	Long	Frequent
		June	0.0-1.5	> 6.0	0.0-0.5	Long	Occasional	Long	Frequent
		July	1.0-1.5	> 6.0	0.0-0.5	---	None	---	---
		August	1.5-3.5	> 6.0	---	---	None	---	---
		September	1.5-3.5	> 6.0	---	---	None	---	---
		October	0.5-1.5	> 6.0	---	---	None	---	---
		November	0.5-1.5	> 6.0	---	---	None	---	---
		December	0.5-1.5	> 6.0	---	---	None	---	---
Banks	A								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
Riverwash	D								
		January	0.0-2.0	> 6.0	---	---	---	---	---
		February	0.0-2.0	> 6.0	---	---	---	---	---
		March	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		April	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		May	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		June	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		July	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		August	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		September	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		October	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		November	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		December	0.0-2.0	> 6.0	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
317:									
Lallie	D								
		January	1.5-3.5	> 6.0	---	---	None	---	---
		February	1.5-3.5	> 6.0	---	---	None	---	---
		March	0.0-1.5	> 6.0	0.0-0.5	Brief	Rare	---	---
		April	0.0-1.5	> 6.0	0.0-0.5	Brief	Rare	Long	Occasional
		May	0.0-1.5	> 6.0	---	---	None	Long	Occasional
		June	0.0-1.5	> 6.0	---	---	None	Long	Occasional
		July	1.5-3.5	> 6.0	---	---	None	---	---
		August	1.5-3.5	> 6.0	---	---	None	---	---
		September	1.5-3.5	> 6.0	---	---	None	---	---
		October	1.5-3.5	> 6.0	---	---	None	---	---
		November	1.5-3.5	> 6.0	---	---	None	---	---
		December	1.5-3.5	> 6.0	---	---	None	---	---
331B:									
Cherry	B								
		All months	---	---	---	---	---	---	---
Gullied land	D								
		All months	---	---	---	---	---	---	---
Havrelon	B								
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
340B:									
Niobell	C								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
341B:									
Noonan	D								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
341B:(cont.)									
Niobell	C								
		April	3.5-5.0	> 6.0	---	---	---	---	---
		May	3.5-5.0	> 6.0	---	---	---	---	---
		June	3.5-5.0	> 6.0	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
341C:									
Noonan	D								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
403F:									
Rhame	B								
		All months	---	---	---	---	---	---	---
Arikara	B								
		All months	---	---	---	---	---	---	---
Fleak	D								
		All months	---	---	---	---	---	---	---
404F:									
Badland, outcrop	D								
		All months	---	---	---	---	---	---	---
Lambert	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
Cabba	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
406:									
Glendive, wooded----------	B								
		March	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		April	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		May	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		June	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
408B:									
Hanly, wooded-------------	A								
		March	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		April	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		May	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
		June	4.0-6.0	> 6.0	---	---	---	Brief	Occasional
410:									
Riverwash-----------------	D								
		January	0.0-2.0	> 6.0	---	---	---	---	---
		February	0.0-2.0	> 6.0	---	---	---	---	---
		March	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		April	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		May	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		June	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		July	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		August	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		September	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		October	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		November	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		December	0.0-2.0	> 6.0	---	---	---	---	---
411B:									
Lambert-------------------	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
412E:									
Lambert	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
Brandenburg	A								
		All months	---	---	---	---	---	---	---
442F:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
460C:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
460D:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Cabba	D								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
470C:									
Zahl	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
470C:(cont.)									
Tally	B								
		All months	---	---	---	---	---	---	---
Williams	B								
		All months	---	---	---	---	---	---	---
470D:									
Zahl	B								
		All months	---	---	---	---	---	---	---
Beisigl	A								
		All months	---	---	---	---	---	---	---
Tally	B								
		All months	---	---	---	---	---	---	---
490:									
Riverwash	D								
		January	0.0-2.0	> 6.0	---	---	---	---	---
		February	0.0-2.0	> 6.0	---	---	---	---	---
		March	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		April	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		May	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		June	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		July	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		August	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		September	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		October	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		November	0.0-2.0	> 6.0	---	---	---	Very long	Frequent
		December	0.0-2.0	> 6.0	---	---	---	---	---
496:									
Pits, gravel and sand, low precipitation	A								
		All months	---	---	---	---	---	---	---
M-W:									
Miscellaneous water	---								
		All months	0.0	0.0-0.0	0.0-6.0	Very long	Frequent	---	---
W:									
Water	---								
		All months	0.0	0.0-0.0	0.0-6.0	Very long	Frequent	---	---

Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
2:									
Heil	Natric	1-4	---	Noncemented	0	---	Moderate	High	Moderate
3:									
Dimmick	---	---	---	---	0	---	Moderate	High	Low
5:									
Tonka	---	---	---	---	0	---	High	High	Low
Hamerly	---	---	---	---	0	---	High	High	Low
7:									
Harriet	Natric	0-5	---	Noncemented	0	---	High	High	Moderate
9:									
Grano	---	---	---	---	0	---	High	High	Low
10:									
Banks	---	---	---	---	0	---	Low	Moderate	Low
10D:									
Seroco	---	---	---	---	0	---	Low	Low	Low
Lohler	---	---	---	---	0	---	Moderate	High	Low
11B:									
Patent	---	---	---	---	0	---	Moderate	High	Low
12:									
Trembles	---	---	---	---	0	---	Moderate	High	Low
13:									
Havrelon	---	---	---	---	0	---	Moderate	High	Low
14:									
Channel	---	---	---	---	---	---	---	---	---
Korchea	---	---	---	---	0	---	Moderate	High	Moderate
15:									
Korchea	---	---	---	---	0	---	Moderate	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
16:									
Ridgelawn	Strongly contrasting textural stratification	20-40	---	---	0	---	Moderate	High	Low
17:									
Lohler	---	---	---	---	0	---	Moderate	High	Low
19:									
Hoffmanville	Strongly contrasting textural stratification	20-40	---	---	0	---	Moderate	High	Low
20:									
Scorio	Strongly contrasting textural stratification	20-40	---	---	0	---	Low	High	Low
21B:									
Tally	---	---	---	---	0	---	Moderate	High	Low
Parshall	---	---	---	---	0	---	Moderate	Moderate	Low
21C:									
Tally	---	---	---	---	0	---	Moderate	High	Low
Parshall	---	---	---	---	0	---	Moderate	Moderate	Low
22:									
Velva	---	---	---	---	0	---	Moderate	High	Low
23B:									
Lihen	---	---	---	---	0	---	Low	High	Low
Parshall	---	---	---	---	0	---	Moderate	Moderate	Low
23D:									
Beisigl	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low
Telfer	---	---	---	---	0	---	Low	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
24:									
Arnegard	---	---	---	---	0	---	Moderate	High	Low
25:									
Farnuf	---	---	---	---	0	---	Moderate	High	Low
25B:									
Farnuf	---	---	---	---	0	---	Moderate	High	Low
25C:									
Farnuf	---	---	---	---	0	---	Moderate	High	Low
26:									
Tansem	---	---	---	---	0	---	Moderate	Moderate	Low
Roseglen	---	---	---	---	0	---	Moderate	Moderate	Low
26B:									
Tansem	---	---	---	---	0	---	Moderate	Moderate	Low
Roseglen	---	---	---	---	0	---	Moderate	Moderate	Low
27:									
Golva	---	---	---	---	0	---	Moderate	High	Moderate
27B:									
Golva	---	---	---	---	0	---	Moderate	High	Moderate
27C:									
Golva	---	---	---	---	0	---	Moderate	High	Moderate
29:									
Savage	---	---	---	---	0	---	Low	High	Low
29B:									
Savage	---	---	---	---	0	---	Low	High	Low
29C:									
Savage	---	---	---	---	0	---	Low	High	Low
30:									
Lawther	---	---	---	---	0	---	Low	High	High
31B:									
Cherry	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
31C:									
Cherry	---	---	---	---	0	---	Moderate	High	Low
32F:									
Cherry	---	---	---	---	0	---	Moderate	High	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
33:									
Belfield	---	---	---	---	0	---	Low	High	Moderate
Grail	---	---	---	---	0	---	Moderate	High	Low
33B:									
Belfield	---	---	---	---	0	---	Low	High	Moderate
Savage	---	---	---	---	0	---	Low	High	Low
34B:									
Daglum	Natric	4-20	---	Noncemented	0	---	Moderate	High	Moderate
Belfield	---	---	---	---	0	---	Low	High	Moderate
36B:									
Rhoades	Natric	1-5	---	Noncemented	0	---	Low	High	Moderate
Daglum	Natric	4-20	---	Noncemented	0	---	Moderate	High	Moderate
38B:									
Dogtooth	Natric	2-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
38F:									
Dogtooth	Natric	2-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
38F:(cont.)									
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
40B:									
Desart	Natric	15-30	---	Noncemented	0	---	Moderate	High	Moderate
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
Ekalaka	Natric	5-20	---	Noncemented	0	---	Moderate	High	Moderate
41:									
Williams	---	---	---	---	0	---	Moderate	High	Low
Bowbells	---	---	---	---	0	---	Moderate	High	Low
41B:									
Williams	---	---	---	---	0	---	Moderate	High	Low
Bowbells	---	---	---	---	0	---	Moderate	High	Low
42B:									
Williams	---	---	---	---	0	---	Moderate	High	Low
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
42C:									
Williams	---	---	---	---	0	---	Moderate	High	Low
43C:									
Williams	---	---	---	---	0	---	Moderate	High	Low
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
44D:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
44D:(cont.)									
Williams	---	---	---	---	0	---	Moderate	High	Low
44E:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Williams	---	---	---	---	0	---	Moderate	High	Low
45F:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Maschetah	---	---	---	---	0	---	Moderate	High	Low
46B:									
Dooley	---	---	---	---	0	---	Moderate	High	Low
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
46C:									
Dooley	---	---	---	---	0	---	Moderate	High	Low
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
46D:									
Dooley	---	---	---	---	0	---	Moderate	High	Low
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
48:									
Temvik	---	---	---	---	0	---	Moderate	High	Low
Wilton	---	---	---	---	0	---	Moderate	Moderate	Low
49:									
Temvik	---	---	---	---	0	---	Moderate	High	Low
Williams	---	---	---	---	0	---	Moderate	High	Low
49B:									
Temvik	---	---	---	---	0	---	Moderate	High	Low
Williams	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
50B:									
Temvik	---	---	---	---	0	---	Moderate	High	Low
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
51B:									
Amor	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Shambo	---	---	---	---	0	---	Moderate	Moderate	Low
51C:									
Amor	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
51D:									
Amor	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
52B:									
Reeder	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Farnuf	---	---	---	---	0	---	Moderate	High	Low
52C:									
Reeder	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
53B:									
Chama	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Sen	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
53C:									
Chama	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Sen	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
53D:									
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Chama	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Sen	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
54F:									
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Sen	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Chama	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
55B:									
Sen	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
56B:									
Lefor	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
56C:									
Lefor	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
61D:									
Beisigl	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low
Flasher	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Low
61F:									
Beisigl	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low
Flasher	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Low
Tally	---	---	---	---	0	---	Moderate	High	Low
62F:									
Flasher	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Low
Rock outcrop	Bedrock (lithic)	0-1	---	---	0	---	Low	Moderate	Low
Vebar	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
63B:									
Vebar	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Flasher	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Low
63C:									
Vebar	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Flasher	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Low
63D:									
Vebar	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Flasher	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
63D:(cont.)									
Tally	---	---	---	---	0	---	Moderate	High	Low
66B:									
Manning	Strongly contrasting textural stratification	24-40	---	---	0	---	Low	Moderate	Low
70B:									
Regent	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	Moderate
Savage	---	---	---	---	0	---	Low	High	Low
70C:									
Regent	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
71B:									
Regent	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	Moderate
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
71C:									
Regent	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	Moderate
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
72B:									
Moreau	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
72C:									
Moreau	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low
Wayden	Bedrock (paralithic)	10-20	---	---	0	---	Low	High	Moderate
72D:									
Moreau	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
80:									
Badland, high precipitation	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
83F:									
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
84F:									
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Chama	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Havrelon	---	---	---	---	0	---	Moderate	High	Low
88D:									
Brandenburg	Strongly contrasting textural stratification	10-20	---	---	0	---	Low	High	Moderate
Searing	Strongly contrasting textural stratification	20-40	---	---	0	---	Moderate	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
88D:(cont.)									
Dogtooth	Natric	2-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
88F:									
Brandenburg	Strongly contrasting textural stratification	10-20	---	---	0	---	Low	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Dogtooth	Natric	2-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
89F:									
Brandenburg	Strongly contrasting textural stratification	10-20	---	---	0	---	Low	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
90E:									
Manning	Strongly contrasting textural stratification	24-40	---	---	0	---	Low	Moderate	Low
Schaller	---	---	---	---	0	---	Low	Moderate	Low
Wabek	Strongly contrasting textural stratification	7-14	---	---	0	---	Low	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
91F:									
Wabek	---	---	---	---	0	---	Low	Moderate	Low
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
93B:									
Lehr	Strongly contrasting textural stratification	14-20	---	---	0	---	Low	Moderate	Low
Stady	Strongly contrasting textural stratification	20-40	---	---	0	---	Moderate	Moderate	Low
94B:									
Searing	Strongly contrasting textural stratification	20-40	---	---	0	---	Moderate	High	Moderate
Ringling	Strongly contrasting textural stratification	12-20	---	---	0	---	Low	Moderate	Low
95:									
Havrelon	---	---	---	---	0	---	Moderate	High	Low
96:									
Pits, gravel and sand	---	---	---	---	0	---	None	Low	Low
98F:									
Tinsley	Strongly contrasting textural stratification	2-7	---	---	0	---	Low	High	Low
Chanta	Strongly contrasting textural stratification	20-40	---	---	0	---	Moderate	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
99:									
Mckeen	---	---	---	---	0	---	High	High	Moderate
100F:									
Boxwell	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Arikara	---	---	---	---	0	---	Moderate	High	Low
101F:									
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
102B:									
Kremlin	---	---	---	---	0	---	Moderate	High	Low
Ethridge	---	---	---	---	0	---	Low	High	Low
Gerda	Natric	0-3	---	Noncemented	0	---	Low	High	High
103B:									
Chinook	---	---	---	---	0	---	Low	High	Low
Rhame	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
103D:									
Rhame	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Chinook	---	---	---	---	0	---	Low	High	Low
103F:									
Rhame	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Fleak	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
104E:									
Badland, outcrop-------	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Patent-----------------	---	---	---	---	0	---	Moderate	High	Low
105:									
Havre------------------	---	---	---	---	0	---	Moderate	High	Low
106:									
Glendive---------------	---	---	---	---	0	---	Moderate	High	Low
107:									
Kremlin----------------	---	---	---	---	0	---	Moderate	High	Low
108B:									
Hanly------------------	---	---	---	---	0	---	Low	Moderate	Low
109:									
Havre, wooded----------	---	---	---	---	0	---	Moderate	High	Low
110B:									
Maltese----------------	Natric	2-15	---	Noncemented	0	---	Moderate	High	Moderate
Gerda------------------	Natric	0-3	---	Noncemented	0	---	Low	High	High
111D:									
Gerda------------------	Natric	0-3	---	Noncemented	0	---	Low	High	High
Kirby------------------	Strongly contrasting textural stratification	12-20	---	---	0	---	Low	High	Low
111F:									
Kirby------------------	Strongly contrasting textural stratification	12-20	---	---	0	---	Low	High	Low
Scairt-----------------	Natric	1-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
112F:									
Kirby	Strongly contrasting textural stratification	12-20	---	---	0	---	Low	High	Low
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Patent	---	---	---	---	0	---	Moderate	High	Low
113F:									
Lonna	---	---	---	---	0	---	Moderate	High	Low
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
114:									
Channel	---	---	---	---	---	---	---	---	---
Glendive	---	---	---	---	0	---	Moderate	High	Low
Havre	---	---	---	---	0	---	Moderate	High	Low
115F:									
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
116F:									
Kremlin	---	---	---	---	0	---	Moderate	High	Low
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
117:									
Wolf Point	---	---	---	---	0	---	Low	High	Low
118F:									
Lonna	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
118F:(cont.)									
Kirby	Strongly contrasting textural stratification	12-20	---	---	0	---	Low	High	Low
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
119F:									
Patent	---	---	---	---	0	---	Moderate	High	Low
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
121F:									
Maltese	Natric	2-15	---	Noncemented	---	---	Moderate	High	Moderate
Lonna	---	---	---	---	0	---	Moderate	High	Low
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
127:									
Maschetah	---	---	---	---	0	---	Moderate	High	Low
127B:									
Maschetah	---	---	---	---	0	---	Moderate	High	Low
127C:									
Maschetah	---	---	---	---	0	---	Moderate	High	Low
131B:									
Lonna	---	---	---	---	0	---	Moderate	High	Low
131C:									
Lonna	---	---	---	---	0	---	Moderate	High	Low
132C:									
Patent	---	---	---	---	0	---	Moderate	High	Low
Gerda	Natric	0-3	---	Noncemented	0	---	Low	High	Moderate
Slickspots	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
138E:									
Scairt	Natric	1-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
Maltese	Natric	2-15	---	Noncemented	0	---	Moderate	High	Moderate
Boxwell	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
145F:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
146B:									
Dooley	---	---	---	---	0	---	Moderate	High	Low
151B:									
Boxwell	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Kremlin	---	---	---	---	0	---	Moderate	High	Low
151D:									
Boxwell	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Kremlin	---	---	---	---	0	---	Moderate	High	Low
154F:									
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
Shambo	---	---	---	---	0	---	Moderate	Moderate	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
161F:									
Beisigl	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
161F:(cont.)									
Flasher	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Low
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
164D:									
Vebar, extremely stony-	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
171:									
Lohler, moderately saline	---	---	---	---	0	---	Moderate	High	Moderate
180:									
Badland	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
183F:									
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
187F:									
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
193B:									
Chanta	Strongly contrasting textural stratification	20-40	---	---	0	---	Moderate	High	Moderate
194F:									
Kirby	Strongly contrasting textural stratification	12-20	---	---	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
194F:(cont.)									
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
195:									
Havrelon	---	---	---	---	0	---	Moderate	High	Moderate
199:									
Mckeen	---	---	---	---	0	---	High	High	Moderate
201F:									
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Cabbart	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
202D:									
Boxwell	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Low
Scairt	Natric	1-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
Maltese	Natric	2-15	---	Noncemented	0	---	Moderate	High	Moderate
203D:									
Rhame	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Kremlin	---	---	---	---	0	---	Moderate	High	Low
Maltese	Natric	2-15	---	Noncemented	0	---	Moderate	High	Moderate
203F:									
Rhame	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Scairt	Natric	1-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
203F:(cont.)									
Kremlin	---	---	---	---	0	---	Moderate	High	Low
205:									
Havre, rarely flooded	---	---	---	---	0	---	Moderate	High	Low
206:									
Glendive, rarely flooded	---	---	---	---	0	---	Moderate	High	Low
207:									
Harriet	Natric	0-5	---	Noncemented	0	---	High	High	Moderate
211F:									
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
212:									
Trembles	---	---	---	---	0	---	Moderate	High	Low
213:									
Havrelon, slightly wet-	---	---	---	---	0	---	Moderate	High	Low
214:									
Channel	---	---	---	---	---	---	---	---	---
Korchea, wooded	---	---	---	---	0	---	Moderate	High	Moderate
217:									
Wolf Point, wooded	---	---	---	---	0	---	Low	High	Low
218F:									
Cherry	---	---	---	---	0	---	Moderate	High	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
218F:(cont.)									
Brandenburg	Strongly contrasting textural stratification	10-20	---	---	0	---	Low	High	Moderate
227:									
Haydraw	---	---	---	---	0	---	Moderate	High	Low
227B:									
Haydraw	---	---	---	---	0	---	Moderate	High	Low
231C:									
Patent	---	---	---	---	0	---	Moderate	High	Low
Gullied land	Bedrock (paralithic)	0-40	---	---	0	---	Moderate	High	Low
Glendive	---	---	---	---	0	---	Moderate	High	Low
232C:									
Lambert	---	---	---	---	0	---	Moderate	High	Low
Slickspots	---	---	---	---	0	---	Moderate	High	Low
Rhoades	Natric	1-5	---	Noncemented	0	---	Low	High	Moderate
238B:									
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
Dogtooth	Natric	2-4	---	Noncemented	0	---	Low	High	Moderate
	Bedrock (paralithic)	20-40	---	---					
239D:									
Vebar	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Janesburg	Natric	2-13	---	Noncemented	0	---	Moderate	High	Moderate
	Bedrock (paralithic)	20-40	---	---					

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
242F:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Williams	---	---	---	---	0	---	Moderate	High	Low
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
287F:									
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
299:									
Minnewaukan	---	---	---	---	0	---	Moderate	High	Low
Banks	---	---	---	---	0	---	Low	Moderate	Low
Riverwash	---	---	---	---	0	---	Low	Moderate	Low
317:									
Lallie	---	---	---	---	0	---	High	High	High
331B:									
Cherry	---	---	---	---	0	---	Moderate	High	Low
Gullied land	Bedrock (paralithic)	0-40	---	---	0	---	Moderate	High	Low
Havrelon	---	---	---	---	0	---	Moderate	High	Low
340B:									
Niobell	---	---	---	---	0	---	Moderate	High	Moderate
Williams	---	---	---	---	0	---	Moderate	High	Low
341B:									
Noonan	Natric	5-10	---	Noncemented	0	---	Moderate	High	Moderate
Niobell	---	---	---	---	0	---	Moderate	High	Moderate
Williams	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
341C:									
Noonan	Natric	5-10	---	Noncemented	0	---	Moderate	High	Moderate
Williams	---	---	---	---	0	---	Moderate	High	Low
403F:									
Rhame	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Arikara	---	---	---	---	0	---	Moderate	High	Moderate
Fleak	Bedrock (paralithic)	7-20	---	---	0	---	Low	Moderate	Moderate
404F:									
Badland, outcrop	Bedrock (paralithic)	0-5	---	---	0	---	Low	High	High
Lambert	---	---	---	---	0	---	Moderate	High	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
406:									
Glendive, wooded	---	---	---	---	0	---	Moderate	High	Low
408B:									
Hanly, wooded	---	---	---	---	0	---	Low	Moderate	Low
410:									
Riverwash	---	---	---	---	0	---	Low	Moderate	Low
411B:									
Lambert	---	---	---	---	0	---	Moderate	High	Low
412E:									
Lambert	---	---	---	---	0	---	Moderate	High	Low
Brandenburg	Strongly contrasting textural stratification	10-20	---	---	0	---	Low	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
442F:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Williams	---	---	---	---	0	---	Moderate	High	Low
460C:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Williams	---	---	---	---	0	---	Moderate	High	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
460D:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Cabba	Bedrock (paralithic)	10-20	---	---	0	---	Moderate	High	Low
Williams	---	---	---	---	0	---	Moderate	High	Low
470C:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Tally	---	---	---	---	0	---	Moderate	High	Low
Williams	---	---	---	---	0	---	Moderate	High	Low
470D:									
Zahl	---	---	---	---	0	---	Moderate	Moderate	Low
Beisigl	Bedrock (paralithic)	20-40	---	---	0	---	Low	Moderate	Low
Tally	---	---	---	---	0	---	Moderate	High	Low
490:									
Riverwash	---	---	---	---	0	---	Low	Moderate	Low
496:									
Pits, gravel and sand, low precipitation	---	---	---	---	0	---	None	Low	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
M-W:									
Miscellaneous water----	---	---	---	---	---	---	---	---	---
W:									
Water------------------	---	---	---	---	---	---	---	---	---

Hydric Soils List

See end of table for criteria codes and definitions.

There may be small areas of included soils or miscellaneous areas that are significant to use and management of the soil; yet are too small to delineate on the soil map at the map's original scale. These may be designated as spot symbols and are described on the conventional and special symbols legend.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
2:							
Heil silty clay, 0 to 1 percent slopes	Heil	Yes	depression	2B3,3	Yes	No	Yes
	Heil, silty clay loam	Yes	depression	2B3,3	Yes	No	Yes
	Grano	Yes	depression	2B3,3	Yes	No	Yes
	Dimmick	Yes	depression	2B3,3	Yes	No	Yes
3:							
Dimmick silty clay loam, 0 to 1 percent slopes	Dimmick	Yes	depression	2B3,3	Yes	No	Yes
	Parnell	Yes	depression	2B3,3	Yes	No	Yes
	Tonka	Yes	depression	2B3,3	Yes	No	Yes
	Grail	No	---	---	---	---	---
5:							
Tonka-Hamerly complex, 0 to 3 percent slopes	Tonka	Yes	depression	2B3,3	Yes	No	Yes
	Hamerly	No	rise	---	---	---	---
	Parnell	Yes	depression	3,2B3	Yes	No	Yes
	Heil	Yes	depression	3,2B3	Yes	No	Yes
	Noonan	No	---	---	---	---	---
	Divide	No	---	---	---	---	---
	Marysland	Yes	flat	2B3	Yes	No	No
	Niobell	No	---	---	---	---	---
	Bowbells	No	---	---	---	---	---
7:							
Harriet silt loam, 0 to 2 percent slopes	Harriet	Yes	alluvial flat, drainageway	2B3	Yes	No	No
	Regan	Yes	drainageway	2B3	Yes	No	No
	Slickspots	No	alluvial flat	---	---	---	---
	Rhoades	No	stream terrace	---	---	---	---
	Heil	Yes	depression	2B3,3	Yes	No	Yes
	Daglum	No	stream terrace	---	---	---	---
9:							
Grano silty clay, 0 to 1 percent slopes	Grano	Yes	depression	2B3,3	Yes	No	Yes
	Heil	Yes	depression	3,2B3	Yes	No	Yes
	Dovray	Yes	depression	2B3,3	Yes	No	Yes
10:							
Banks fine sandy loam, slightly wet, 0 to 1 percent slopes	Banks	No	flat, flood plain	---	---	---	---
	Banks, silty clay loam	No	---	---	---	---	---
	Banks, loamy fine sand	No	---	---	---	---	---
	Ridgelawn	No	---	---	---	---	---
	Trembles	No	---	---	---	---	---
10D:							
Seroco-Lohler complex, 0 to 15 percent slopes	Seroco	No	dune	---	---	---	---
	Lohler	No	flat, flood plain	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
11B:							
Patent loam, 1 to 6 percent slopes	Patent	No	alluvial fan	---	---	---	---
	Sham	No	alluvial fan	---	---	---	---
	Lonna	No	alluvial fan	---	---	---	---
	Benz	No	alluvial fan	---	---	---	---
	Kremlin	No	alluvial fan	---	---	---	---
12:							
Trembles fine sandy loam, 0 to 2 percent slopes	Trembles	No	flood plain	---	---	---	---
	Havrelon	No	flat, flood plain, river valley	---	---	---	---
	Channel	No	---	---	---	---	---
	Banks	No	flood plain	---	---	---	---
	Korchea	No	flood plain	---	---	---	---
	Rhoades	No	alluvial flat	---	---	---	---
13:							
Havrelon silt loam, 0 to 2 percent slopes	Havrelon	No	flat, flood plain	---	---	---	---
	Havrelon, fine sandy loam	No	---	---	---	---	---
	Channel	No	---	---	---	---	---
	Banks	No	---	---	---	---	---
	Havrelon, silty clay loam	No	---	---	---	---	---
	Ridgelawn	No	---	---	---	---	---
	Trembles	No	---	---	---	---	---
	Lallie	Yes	flood plain	2B3	Yes	No	No
14:							
Korchea loam, channeled, 0 to 2 percent slopes	Korchea	No	flood plain	---	---	---	---
	Channel	No	---	---	---	---	---
	Velva	No	---	---	---	---	---
15:							
Korchea loam, 0 to 2 percent slopes	Korchea	No	flood plain	---	---	---	---
	Shambo	No	alluvial flat, terrace	---	---	---	---
	Straw	No	flood plain	---	---	---	---
	Channel	No	---	---	---	---	---
	Havrelon	No	flat, flood plain, river valley	---	---	---	---
	Velva	No	terrace, flood plain	---	---	---	---
	Daglum	No	alluvial flat	---	---	---	---
16:							
Ridgelawn silt loam, slightly wet, 0 to 2 percent slopes	Ridgelawn	No	flat, flood	---	---	---	---
	Banks, loam	No	---	---	---	---	---
	Trembles	No	---	---	---	---	---
	Havrelon	No	---	---	---	---	---
	Lohler	No	---	---	---	---	---
	Hoffmanville	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
17:							
Lohler silty clay, slightly wet, 0 to 2 percent slopes	Lohler	No	flood plain	---	---	---	---
	Havrelon	No	flat, flood plain, river valley	---	---	---	---
	Lallie, drained	Yes	flood plain, oxbow	2B3,3	Yes	No	Yes
19:							
Hoffmanville silty clay, slightly wet, 0 to 2 percent slopes	Hoffmanville	No	flat, flood plain	---	---	---	---
	Lohler	No	---	---	---	---	---
	Scorio	No	---	---	---	---	---
	Ridgelawn	No	---	---	---	---	---
	Banks, silty clay	No	---	---	---	---	---
20:							
Scorio silty clay, slightly wet, 0 to 2 percent slopes	Scorio	No	flood plain	---	---	---	---
	Scorio, silty clay loam	No	flood plain	---	---	---	---
	Lohler	No	flood plain	---	---	---	---
	Scorio, saline	No	flood plain	---	---	---	---
	Havrelon	No	flat, flood plain, river valley	---	---	---	---
21B:							
Tally-Parshall fine sandy loams, 0 to 6 percent slopes	Tally	No	alluvial fan, terrace	---	---	---	---
	Parshall	No	alluvial fan, swale, terrace	---	---	---	---
	Shambo	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Lihen	No	---	---	---	---	---
	Krem	No	---	---	---	---	---
	Ekalaka	No	---	---	---	---	---
	Lefor	No	---	---	---	---	---
21C:							
Tally-Parshall fine sandy loams, 6 to 9 percent slopes	Tally	No	ridge	---	---	---	---
	Parshall	No	ridge	---	---	---	---
	Parshall, gently sloping	No	---	---	---	---	---
	Tally, strongly sloping	No	---	---	---	---	---
	Telfer	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
	Cohagen	No	---	---	---	---	---
	Grail	No	---	---	---	---	---
	Manning	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
22:							
Velva fine sandy loam, 0 to 2 percent slopes	Velva	No	terrace, flood plain	---	---	---	---
	Banks	No	---	---	---	---	---
	Korchea	No	---	---	---	---	---
	Channel	No	---	---	---	---	---
	Breien	No	---	---	---	---	---
	Minnewaukan	Yes	channel	2B2	Yes	No	No
23B:							
Lihen-Parshall complex, 0 to 6 percent slopes	Lihen	No	alluvial fan, alluvial flat	---	---	---	---
	Parshall	No	swale	---	---	---	---
	Telfer	No	alluvial fan, alluvial flat	---	---	---	---
	Tally	No	alluvial fan, alluvial flat	---	---	---	---
	Stady	No	stream terrace	---	---	---	---
	Lihen, fine sandy loam	No	alluvial fan, alluvial flat	---	---	---	---
	Seroco	No	alluvial fan	---	---	---	---
	Shambo	No	alluvial fan, alluvial flat	---	---	---	---
	Beisigl	No	pediment	---	---	---	---
	Manning	No	stream terrace	---	---	---	---
23D:							
Beisigl-Telfer loamy fine sands, 6 to 15 percent slopes	Beisigl	No	hill, ridge	---	---	---	---
	Telfer	No	hill, ridge	---	---	---	---
	Tally	No	---	---	---	---	---
	Flasher	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
	Lakota	No	---	---	---	---	---
24:							
Arnegard loam, 0 to 2 percent slopes	Arnegard	No	alluvial flat, swale	---	---	---	---
	Farnuf	No	alluvial flat, rise	---	---	---	---
	Parshall	No	alluvial flat, swale	---	---	---	---
	Belfield	No	alluvial flat, rise	---	---	---	---
	Grail	No	alluvial flat, swale	---	---	---	---
	Stady	No	stream terrace	---	---	---	---
	Amor	No	pediment	---	---	---	---
	Savage	No	alluvial flat, rise	---	---	---	---
25:							
Farnuf loam, 0 to 2 percent slopes	Farnuf	No	flat, terrace	---	---	---	---
	Arnegard	No	swale	---	---	---	---
	Farland	No	flat	---	---	---	---
	Parshall	No	flat, terrace	---	---	---	---
	Shambo	No	flat	---	---	---	---
	Belfield	No	rise, terrace	---	---	---	---
	Bowdle	No	flat	---	---	---	---
	Felor	No	rise	---	---	---	---
	Lehr	No	rise	---	---	---	---
	Reeder	No	rise	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
25B:							
Farnuf loam, 2 to 6 percent slopes	Farnuf	No	alluvial fan, terrace	---	---	---	---
	Shambo	No	fan	---	---	---	---
	Arnegard	No	swale	---	---	---	---
	Belfield	No	flat	---	---	---	---
	Reeder	No	rise	---	---	---	---
	Parshall	No	swale	---	---	---	---
	Stady	No	flat	---	---	---	---
	Maschetah	No	fan	---	---	---	---
25C:							
Farnuf loam, 6 to 9 percent slopes	Farnuf	No	alluvial fan, ridge	---	---	---	---
	Shambo	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Belfield	No	---	---	---	---	---
	Cherry	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
26:							
Tansem-Roseglen silt loams, 0 to 3 percent slopes	Tansem	No	rise	---	---	---	---
	Roseglen	No	swale	---	---	---	---
	Makoti	No	---	---	---	---	---
	Williams	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Stady	No	---	---	---	---	---
26B:							
Tansem-Roseglen silt loams, 3 to 6 percent slopes	Tansem	No	rise	---	---	---	---
	Roseglen	No	swale	---	---	---	---
	Cabba	No	---	---	---	---	---
	Sakakawea	No	---	---	---	---	---
	Lihen	No	---	---	---	---	---
	Parshall	No	---	---	---	---	---
27:							
Golva silt loam, 0 to 2 percent slopes	Golva	No	alluvial flat	---	---	---	---
	Golva, silty clay loam	No	---	---	---	---	---
	Farland	No	---	---	---	---	---
	Velva	No	---	---	---	---	---
	Korchea	No	---	---	---	---	---
	Lehr	No	---	---	---	---	---
27B:							
Golva silt loam, 2 to 6 percent slopes	Golva	No	alluvial fan	---	---	---	---
	Grassna	No	---	---	---	---	---
	Sen	No	---	---	---	---	---
	Belfield	No	---	---	---	---	---
	Maschetah	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Lawther	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
27C:							
Golva silt loam, 6 to 9 percent slopes	Golva	No	alluvial fan, ridge	---	---	---	---
	Golva, strongly sloping	No	---	---	---	---	---
	Cherry	No	---	---	---	---	---
	Grassna	No	---	---	---	---	---
	Sen	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
29:							
Savage silty clay loam, 0 to 2 percent slopes	Savage	No	alluvial flat	---	---	---	---
	Grail	No	swale	---	---	---	---
	Belfield	No	alluvial flat	---	---	---	---
	Farnuf	No	alluvial flat	---	---	---	---
	Regent	No	pediment	---	---	---	---
	Daglum	No	alluvial flat	---	---	---	---
	Lawther	No	alluvial flat	---	---	---	---
	Parshall	No	swale	---	---	---	---
29B:							
Savage silty clay loam, 2 to 6 percent slopes	Savage	No	alluvial fan	---	---	---	---
	Grail	No	swale	---	---	---	---
	Farland	No	alluvial fan	---	---	---	---
	Regent	No	pediment	---	---	---	---
	Shambo	No	alluvial fan	---	---	---	---
	Daglum	No	alluvial fan	---	---	---	---
	Amor	No	pediment	---	---	---	---
	Stady	No	stream terrace	---	---	---	---
29C:							
Savage silty clay loam, 6 to 9 percent slopes	Savage	No	ridge	---	---	---	---
	Savage, gently sloping	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Daglum	No	---	---	---	---	---
	Regent	No	---	---	---	---	---
	Farland	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Grail	No	---	---	---	---	---
	Maschetah	No	---	---	---	---	---
30:							
Lawther silty clay, 0 to 2 percent slopes	Lawther	No	alluvial flat, terrace	---	---	---	---
	Savage	No	alluvial fan	---	---	---	---
	Belfield	No	alluvial flat	---	---	---	---
	Moreau	No	rise	---	---	---	---
	Daglum	No	alluvial flat	---	---	---	---
	Cabba	No	knob	---	---	---	---
31B:							
Cherry silt loam, 0 to 6 percent slopes	Cherry	No	alluvial fan	---	---	---	---
	Maschetah	No	alluvial fan	---	---	---	---
	Golva	No	alluvial flat	---	---	---	---
	Havrelon	No	flat, flood plain, river valley	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
31C:							
Cherry silt loam, 6 to 9 percent slopes	Cherry	No	alluvial fan	---	---	---	---
	Lambert	No	alluvial fan	---	---	---	---
	Maschetah	No	alluvial fan	---	---	---	---
	Farnuf	No	flat, terrace	---	---	---	---
	Daglum	No	hillslope	---	---	---	---
	Cabba	No	ridge	---	---	---	---
32F:							
Cherry-Cabba silt loams, 9 to 40 percent slopes	Cabba	No	ridge	---	---	---	---
	Cherry	No	alluvial fan	---	---	---	---
	Cherry, strongly sloping	No	alluvial fan	---	---	---	---
	Chama	No	ridge	---	---	---	---
	Maschetah	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Lambert	No	alluvial fan	---	---	---	---
	Janesburg	No	ridge	---	---	---	---
	Amor	No	---	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
33:							
Belfield-Grail silty clay loams, 0 to 2 percent slopes	Belfield	No	alluvial flat	---	---	---	---
	Grail	No	swale	---	---	---	---
	Savage	No	alluvial flat	---	---	---	---
	Daglum	No	alluvial flat	---	---	---	---
	Farnuf	No	alluvial flat	---	---	---	---
	Arnegard	No	swale	---	---	---	---
	Lawther	No	alluvial flat	---	---	---	---
	Regent	No	pediment	---	---	---	---
	Straw	No	flood plain	---	---	---	---
33B:							
Belfield-Savage silty clay loams, 2 to 6 percent slopes	Belfield	No	alluvial fan	---	---	---	---
	Savage	No	alluvial fan	---	---	---	---
	Daglum	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Grail	No	---	---	---	---	---
	Golva	No	---	---	---	---	---
34B:							
Daglum-Belfield complex, 0 to 6 percent slopes	Daglum	No	alluvial fan	---	---	---	---
	Belfield	No	alluvial fan	---	---	---	---
	Rhoades	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Lawther	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
36B:							
Rhoades-Daglum complex, 0 to 6 percent slopes	Rhoades	No	alluvial fan, alluvial flat	---	---	---	---
	Daglum	No	alluvial fan, alluvial flat	---	---	---	---
	Belfield	No	alluvial fan, alluvial flat, rise, rise	---	---	---	---
	Savage	No	alluvial fan, rise	---	---	---	---
	Moreau	No	pediment	---	---	---	---
	Slickspots	No	alluvial flat	---	---	---	---
38B:							
Dogtooth-Janesburg silt loams, 0 to 6 percent slopes	Dogtooth	No	pediment	---	---	---	---
	Janesburg	No	pediment	---	---	---	---
	Daglum	No	alluvial fan, alluvial flat	---	---	---	---
	Regent	No	pediment	---	---	---	---
	Savage	No	alluvial flat	---	---	---	---
	Slickspots	No	alluvial flat	---	---	---	---
	Wayden	No	pediment, rise	---	---	---	---
	Chama	No	pediment	---	---	---	---
38F:							
Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	Dogtooth	No	hill, ridge	---	---	---	---
	Janesburg	No	hill, ridge	---	---	---	---
	Cabba	No	hill, ridge	---	---	---	---
	Moreau	No	hill, ridge	---	---	---	---
	Wayden	No	hill, ridge	---	---	---	---
	Amor	No	hill, ridge	---	---	---	---
	Chama	No	hill, ridge	---	---	---	---
	Ekalaka	No	hill, ridge	---	---	---	---
	Regan	Yes	drainageway	2B3	Yes	No	No
	Slickspots	No	hill, ridge	---	---	---	---
40B:							
Desart-Janesburg-Ekalaka complex, 0 to 6 percent slopes	Desart	No	alluvial fan	---	---	---	---
	Janesburg	No	fan, rise	---	---	---	---
	Ekalaka	No	alluvial fan	---	---	---	---
	Tally	No	---	---	---	---	---
	Daglum	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Belfield	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
	Shambo	No	---	---	---	---	---
	Heil	Yes	depression	3,2B3	Yes	No	Yes
41:							
Williams-Bowbells loams, 0 to 3 percent slopes	Williams	No	rise	---	---	---	---
	Bowbells	No	swale	---	---	---	---
	Max	No	---	---	---	---	---
	Temvik	No	---	---	---	---	---
	Tonka	Yes	depression	2B3,3	Yes	No	Yes
	Heil	Yes	depression	3,2B3	Yes	No	Yes
	Manning	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
41B:							
Williams-Bowbells loams, 3 to 6 percent slopes	Williams	No	rise	---	---	---	---
	Bowbells	No	swale	---	---	---	---
	Max	No	---	---	---	---	---
	Zahl	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Tonka	Yes	depression	3,2B3	Yes	No	Yes
	Vebar	No	---	---	---	---	---
42B:							
Williams-Zahl loams, 3 to 6 percent slopes	Williams	No	knoll, ridge	---	---	---	---
	Zahl	No	knoll, ridge	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Max	No	---	---	---	---	---
	Dooley	No	---	---	---	---	---
	Niobell	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Tonka	Yes	depression	3,2B3	Yes	No	Yes
42C:							
Williams loam, 6 to 9 percent slopes	Williams	No	ridge	---	---	---	---
	Williams, undulating	No	---	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Niobell	No	---	---	---	---	---
	Zahl	No	---	---	---	---	---
	Moreau	No	---	---	---	---	---
	Noonan	No	---	---	---	---	---
43C:							
Williams-Zahl loams, 6 to 9 percent slopes	Williams	No	ridge	---	---	---	---
	Zahl	No	ridge	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Cabba	No	hill, ridge	---	---	---	---
	Amor	No	hill, ridge	---	---	---	---
	Max	No	---	---	---	---	---
	Williams, undulating	No	---	---	---	---	---
	Zahl, rolling	No	---	---	---	---	---
	Noonan	No	---	---	---	---	---
44D:							
Zahl-Williams loams, 9 to 15 percent slopes	Zahl	No	ridge	---	---	---	---
	Williams	No	ridge	---	---	---	---
	Max	No	---	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Wabek	No	---	---	---	---	---
44E:							
Zahl-Williams loams, 15 to 25 percent slopes	Zahl	No	knoll, ridge	---	---	---	---
	Williams	No	knoll, ridge	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Cohagen	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
45F:							
Zahl-Cabba-Maschetah complex, 3 to 70 percent slopes	Zahl	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Maschetah	No	ridge	---	---	---	---
	Williams	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Straw	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
	Dooley	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Wabek	No	---	---	---	---	---
46B:							
Dooley-Zahl complex, 3 to 6 percent slopes	Dooley	No	knoll, ridge	---	---	---	---
	Livona	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Zahl	No	knoll, ridge	---	---	---	---
	Williams	No	---	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Flasher	No	ridge	---	---	---	---
	Manning	No	---	---	---	---	---
	Noonan	No	---	---	---	---	---
46C:							
Dooley-Zahl complex, 6 to 9 percent slopes	Dooley	No	knoll, ridge	---	---	---	---
	Zahl	No	knoll, ridge	---	---	---	---
	Livona	No	---	---	---	---	---
	Williams	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
	Beisigl	No	---	---	---	---	---
	Telfer	No	---	---	---	---	---
46D:							
Dooley-Zahl complex, 9 to 15 percent slopes	Dooley	No	knoll, ridge	---	---	---	---
	Zahl	No	knoll, ridge	---	---	---	---
	Livona	No	---	---	---	---	---
	Williams	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Dooley, moderately sloping	No	---	---	---	---	---
	Flasher	No	---	---	---	---	---
	Niobell	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
48:							
Temvik-Wilton silt loams, 0 to 3 percent slopes	Temvik	No	till plain, rise	---	---	---	---
	Wilton	No	swale, till plain, flat	---	---	---	---
	Williams	No	---	---	---	---	---
	Grassna	No	---	---	---	---	---
49:							
Temvik-Williams silt loams, 0 to 3 percent slopes	Temvik	No	flat	---	---	---	---
	Williams	No	rise	---	---	---	---
	Wilton	No	---	---	---	---	---
	Max	No	---	---	---	---	---
	Grassna	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
49B:							
Temvik-Williams silt loams, 3 to 6 percent slopes	Temvik	No	flat, till plain	---	---	---	---
	Wilton	No	---	---	---	---	---
	Williams	No	rise, till plain	---	---	---	---
	Max	No	---	---	---	---	---
	Bryant	No	---	---	---	---	---
	Zahl	No	---	---	---	---	---
	Flaxton	No	---	---	---	---	---
50B:							
Temvik-Zahl complex, 3 to 6 percent slopes	Temvik	No	flat	---	---	---	---
	Zahl	No	rise	---	---	---	---
	Williams	No	---	---	---	---	---
	Max	No	---	---	---	---	---
	Grassna	No	---	---	---	---	---
51B:							
Amor-Shambo loams, 3 to 6 percent slopes	Amor	No	pediment	---	---	---	---
	Shambo	No	alluvial fan	---	---	---	---
	Morton	No	pediment	---	---	---	---
	Chama	No	pediment	---	---	---	---
	Cabba	No	pediment, rise	---	---	---	---
	Arnegard	No	swale	---	---	---	---
	Vebar	No	pediment	---	---	---	---
51C:							
Amor-Cabba loams, 6 to 9 percent slopes	Amor	No	knoll, ridge	---	---	---	---
	Cabba	No	knoll, ridge	---	---	---	---
	Amor, gently sloping	No	knoll, ridge	---	---	---	---
	Shambo	No	knoll, ridge	---	---	---	---
	Chama	No	knoll, ridge	---	---	---	---
	Cohagen	No	knoll, ridge	---	---	---	---
	Regent	No	knoll, ridge	---	---	---	---
	Savage	No	knoll, ridge	---	---	---	---
51D:							
Amor-Cabba loams, 9 to 15 percent slopes	Amor	No	hill, ridge	---	---	---	---
	Cabba	No	hill, ridge	---	---	---	---
	Amor, moderately sloping	No	hill, ridge	---	---	---	---
	Shambo	No	hill, ridge	---	---	---	---
	Chama	No	hill, ridge	---	---	---	---
	Cohagen	No	hill, ridge	---	---	---	---
	Vebar	No	hill, ridge	---	---	---	---
	Arnegard	No	swale	---	---	---	---
	Dogtooth	No	hill, ridge	---	---	---	---
	Regent	No	hill, ridge	---	---	---	---
	Savage	No	hill, ridge	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
52B:							
Reeder-Farnuf loams, 3 to 6 percent slopes	Reeder	No	rise	---	---	---	---
	Farnuf	No	rise	---	---	---	---
	Amor	No	---	---	---	---	---
	Arnegard	No	alluvial flat, swale	---	---	---	---
	Daglum	No	---	---	---	---	---
	Regent	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
52C:							
Reeder-Cabba loams, 6 to 9 percent slopes	Reeder	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Regent	No	---	---	---	---	---
	Reeder, gently sloping	No	---	---	---	---	---
	Regent, gently sloping	No	---	---	---	---	---
	Farland	No	---	---	---	---	---
	Williams	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Lefor	No	---	---	---	---	---
53B:							
Chama-Sen-Cabba silt loams, 3 to 6 percent slopes	Chama	No	pediment	---	---	---	---
	Sen	No	pediment	---	---	---	---
	Cabba	No	pediment, rise	---	---	---	---
	Golva	No	alluvial fan	---	---	---	---
	Chama, moderately sloping	No	pediment	---	---	---	---
	Janesburg	No	pediment	---	---	---	---
	Maschetah	No	alluvial fan	---	---	---	---
53C:							
Chama-Cabba-Sen silt loams, 6 to 9 percent slopes	Chama	No	knoll, ridge	---	---	---	---
	Cabba	No	knoll, ridge	---	---	---	---
	Sen	No	knoll, ridge	---	---	---	---
	Cohagen	No	knoll, ridge	---	---	---	---
	Chama, gently sloping	No	knoll, ridge	---	---	---	---
	Golva	No	knoll, ridge	---	---	---	---
	Grail	No	swale	---	---	---	---
	Janesburg	No	knoll, ridge	---	---	---	---
	Vebar	No	knoll, ridge	---	---	---	---
53D:							
Cabba-Chama-Sen silt loams, 9 to 15 percent slopes	Cabba	No	hill, ridge	---	---	---	---
	Chama	No	hill, ridge	---	---	---	---
	Sen	No	hill, ridge	---	---	---	---
	Vebar	No	hill, ridge	---	---	---	---
	Arnegard	No	swale	---	---	---	---
	Cabba, gently sloping	No	hill, ridge	---	---	---	---
	Janesburg	No	hill, ridge	---	---	---	---
	Golva	No	hill, ridge	---	---	---	---
	Maschetah	No	hill, ridge	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
54F:							
Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	Cabba	No	ridge	---	---	---	---
	Sen	No	ridge	---	---	---	---
	Chama	No	ridge	---	---	---	---
	Shambo	No	ridge	---	---	---	---
	Regent	No	ridge	---	---	---	---
	Vebar	No	ridge	---	---	---	---
	Janesburg	No	ridge	---	---	---	---
	Regan	Yes	drainageway	2B3	Yes	No	No
	Rock outcrop	No	---	---	---	---	---
	Straw	No	drainageway	---	---	---	---
55B:							
Sen-Janesburg silt loams, 0 to 6 percent slopes	Sen	No	pediment	---	---	---	---
	Janesburg	No	pediment	---	---	---	---
	Regent	No	pediment	---	---	---	---
	Farland	No	alluvial fan	---	---	---	---
	Dogtooth	No	pediment	---	---	---	---
	Chama	No	pediment	---	---	---	---
	Reeder	No	pediment	---	---	---	---
	Belfield	No	alluvial fan, alluvial flat	---	---	---	---
	Cabba	No	pediment, rise	---	---	---	---
56B:							
Lefor fine sandy loam, 0 to 6 percent slopes	Lefor	No	pediment	---	---	---	---
	Parshall	No	swale	---	---	---	---
	Vebar	No	pediment	---	---	---	---
	Belfield	No	alluvial fan	---	---	---	---
	Cohagen	No	pediment, rise	---	---	---	---
	Dogtooth	No	pediment	---	---	---	---
	Lihen	No	alluvial fan	---	---	---	---
	Heil	Yes	depression	3,2B3	Yes	No	Yes
56C:							
Lefor fine sandy loam, 6 to 9 percent slopes	Lefor	No	ridge	---	---	---	---
	Cabba	No	---	---	---	---	---
	Regent	No	---	---	---	---	---
	Parshall	No	---	---	---	---	---
	Cohagen	No	---	---	---	---	---
	Lefor, strongly sloping	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
61D:							
Beisigl-Flasher loamy fine sands, 6 to 15 percent slopes	Beisigl	No	ridge	---	---	---	---
	Flasher	No	ridge	---	---	---	---
	Telfer	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
	Parshall	No	---	---	---	---	---
61F:							
Beisigl-Flasher-Tally complex, 9 to 50 percent slopes	Beisigl	No	ridge	---	---	---	---
	Flasher	No	ridge	---	---	---	---
	Tally	No	ridge	---	---	---	---
	Vebar	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Telfer	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Regan	Yes	drainageway	2B3	Yes	No	No

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
62F:							
Flasher-Rock outcrop-Vebar complex, 9 to 70 percent slopes	Flasher	No	hill, ridge	---	---	---	---
	Rock outcrop	No	hill, ridge	---	---	---	---
	Vebar	No	hill, ridge	---	---	---	---
	Beisigl	No	hill, ridge	---	---	---	---
	Tally	No	hill, ridge	---	---	---	---
	Cohagen	No	hill, ridge	---	---	---	---
	Telfer	No	hill, ridge	---	---	---	---
	Amor	No	hill, ridge	---	---	---	---
	Cabba	No	hill, ridge	---	---	---	---
63B:							
Vebar-Flasher complex, 3 to 6 percent slopes	Vebar	No	rise	---	---	---	---
	Flasher	No	rise	---	---	---	---
	Cohagen	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Beisigl	No	---	---	---	---	---
	Parshall	No	---	---	---	---	---
	Dooley	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
63C:							
Vebar-Flasher complex, 6 to 9 percent slopes	Vebar	No	ridge	---	---	---	---
	Tally	No	---	---	---	---	---
	Flasher	No	ridge	---	---	---	---
	Cohagen	No	---	---	---	---	---
	Beisigl	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Zahl	No	---	---	---	---	---
	Peta, fine sandy loam	No	alluvial flat	---	---	---	---
63D:							
Vebar-Flasher-Tally complex, 9 to 15 percent slopes	Vebar	No	hill, ridge	---	---	---	---
	Flasher	No	hill, ridge	---	---	---	---
	Tally	No	hill, ridge	---	---	---	---
	Cohagen	No	hill, ridge	---	---	---	---
	Vebar, moderately sloping	No	hill, ridge	---	---	---	---
	Beisigl	No	hill, ridge	---	---	---	---
	Parshall	No	swale	---	---	---	---
	Amor	No	hill, ridge	---	---	---	---
	Telfer	No	hill, ridge	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
66B:							
Manning fine sandy loam, 0 to 6 percent slopes	Manning	No	river valley, stream terrace	---	---	---	---
	Parshall	No	river valley, stream terrace, swale	---	---	---	---
	Stady	No	river valley, stream terrace	---	---	---	---
	Shambo, gravelly substratum	No	river valley, stream terrace	---	---	---	---
	Wabek	No	river valley, stream terrace	---	---	---	---
	Vebar	No	pediment, river valley, stream terrace	---	---	---	---
70B:							
Regent-Savage silty clay loams, 3 to 6 percent slopes	Regent	No	pediment	---	---	---	---
	Savage	No	alluvial fan	---	---	---	---
	Moreau	No	pediment	---	---	---	---
	Cabba	No	pediment, rise	---	---	---	---
	Chama	No	pediment	---	---	---	---
	Daglum	No	alluvial fan	---	---	---	---
	Wayden	No	pediment, rise	---	---	---	---
70C:							
Regent-Cabba complex, 6 to 9 percent slopes	Regent	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Regent, gently sloping	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Moreau	No	---	---	---	---	---
	Wayden	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
71B:							
Regent-Janesburg complex, 0 to 6 percent slopes	Regent	No	rise	---	---	---	---
	Janesburg	No	rise	---	---	---	---
	Belfield	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
	Moreau	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
71C:							
Regent-Janesburg complex, 6 to 9 percent slopes	Regent	No	hill	---	---	---	---
	Janesburg	No	hill	---	---	---	---
	Regent, gently sloping	No	---	---	---	---	---
	Belfield	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
	Moreau	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Wayden	No	---	---	---	---	---
	Chama	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
72B:							
Moreau silty clay, 0 to 6 percent slopes	Moreau	No	rise	---	---	---	---
	Moreau, silty clay loam	No	---	---	---	---	---
	Wayden	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Regent	No	---	---	---	---	---
	Lawther	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
72C:							
Moreau-Wayden silty clays, 6 to 9 percent slopes	Moreau	No	ridge	---	---	---	---
	Wayden	No	ridge	---	---	---	---
	Lawther	No	---	---	---	---	---
	Regent	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Moreau, strongly sloping	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
72D:							
Moreau-Cabba complex, 9 to 15 percent slopes	Moreau	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Chama	No	---	---	---	---	---
	Morton	No	---	---	---	---	---
	Regent	No	---	---	---	---	---
	Lawther	No	---	---	---	---	---
	Wayden	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
80:							
Badland, high precipitation	Badland, high precipitation	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Lambert	No	alluvial fan	---	---	---	---
	Moreau	No	ridge	---	---	---	---
83F:							
Cabba-Badland, outcrop complex, 9 to 70 percent slopes	Cabba	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Chama	No	ridge	---	---	---	---
	Flasher	No	ridge	---	---	---	---
	Amor	No	ridge	---	---	---	---
	Cherry	No	---	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Lihen	No	rise	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
84F:							
Cabba-Chama-Havrelon silt loams, 3 to 70 percent slopes	Cabba	No	ridge	---	---	---	---
	Chama	No	ridge	---	---	---	---
	Cherry	No	---	---	---	---	---
	Havrelon	No	flood plain	---	---	---	---
	Amor	No	---	---	---	---	---
	Flasher	No	---	---	---	---	---
	Maschetah	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
88D:							
Brandenburg-Searing-Dogtooth complex, 6 to 15 percent slopes	Brandenburg	No	hill, ridge	---	---	---	---
	Searing	No	hill, ridge	---	---	---	---
	Dogtooth	No	hill, ridge	---	---	---	---
	Regent	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Sen	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
	Wayden	No	---	---	---	---	---
88F:							
Brandenburg-Cabba-Dogtooth complex, 15 to 70 percent slopes	Brandenburg	No	hill, ridge	---	---	---	---
	Cabba	No	hill, ridge	---	---	---	---
	Dogtooth	No	hill, ridge	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Searing	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Rock outcrop	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
89F:							
Brandenburg-Cabba-Badland, outcrop complex, 9 to 70 percent slopes	Brandenburg	No	hill	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Dogtooth	No	fan, hill	---	---	---	---
	Chama	No	ridge	---	---	---	---
	Rock outcrop	No	ridge	---	---	---	---
	Flasher	No	ridge	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Searing	No	---	---	---	---	---
	Lambert	No	---	---	---	---	---
90E:							
Manning-Schaller-Wabek complex, 6 to 25 percent slopes	Manning	No	escarpment, stream terrace	---	---	---	---
	Schaller	No	escarpment, stream terrace	---	---	---	---
	Wabek	No	escarpment, stream terrace	---	---	---	---
	Stady	No	escarpment, stream terrace	---	---	---	---
	Tally	No	escarpment, stream terrace	---	---	---	---
	Cabba	No	escarpment, stream terrace	---	---	---	---
	Janesburg	No	escarpment, stream terrace	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
91F:							
Wabek-Zahl complex, 9 to 35 percenet slopes	Wabek	No	ridge	---	---	---	---
	Zahl	No	ridge	---	---	---	---
	Manning	No	---	---	---	---	---
	Williams	No	---	---	---	---	---
	Schaller	No	---	---	---	---	---
	Stady	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
93B:							
Lehr-Stady loams, 0 to 6 percent slopes	Lehr	No	terrace	---	---	---	---
	Stady	No	terrace	---	---	---	---
	Bowdle	No	---	---	---	---	---
	Shambo	No	---	---	---	---	---
	Manning	No	---	---	---	---	---
	Wanagan	No	---	---	---	---	---
	Wabek	No	---	---	---	---	---
94B:							
Searing-Ringling loams, 0 to 6 percent slopes	Searing	No	pediment	---	---	---	---
	Ringling	No	pediment, rise	---	---	---	---
	Farnuf	No	alluvial fan, alluvial flat	---	---	---	---
	Belfield	No	alluvial fan	---	---	---	---
	Amor	No	pediment	---	---	---	---
	Brandenburg	No	pediment, rise	---	---	---	---
	Cabba	No	pediment, rise	---	---	---	---
	Chama	No	pediment	---	---	---	---
95:							
Havrelon silty clay, slightly wet, 0 to 2 percent slopes	Havrelon	No	flood plain	---	---	---	---
	Havrelon, silt loam	No	---	---	---	---	---
	Lohler	No	---	---	---	---	---
96:							
Pits, gravel and sand	Pits, gravel and sand	No	stream terrace	---	---	---	---
	Wabek	No	stream terrace	---	---	---	---
	Lehr	No	stream terrace	---	---	---	---
98F:							
Tinsley-Chanta complex, 6 to 35 percent slopes	Tinsley	No	escarpment, paleoterrace	---	---	---	---
	Chanta	No	escarpment, paleoterrace	---	---	---	---
	Chinook	No	escarpment, paleoterrace	---	---	---	---
	Cozberg	No	escarpment, paleoterrace	---	---	---	---
	Cabbart	No	escarpment, paleoterrace	---	---	---	---
	Rhame	No	escarpment, paleoterrace	---	---	---	---
	Kremlin	No	escarpment, paleoterrace	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
99:							
Mckeen loam, 0 to 1 percent slopes	Mckeen	Yes	flood plain, oxbow	2B3,4,3	Yes	Yes	Yes
	Lallie	Yes	flood plain	4,2B3	Yes	Yes	No
	Scorio, saline	No	flood plain	---	---	---	---
	Scorio, silty clay loam	No	flood plain	---	---	---	---
100F:							
Boxwell-Cabbart-Arikara complex, 9 to 50 percent slopes	Boxwell	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Rhame	No	ridge	---	---	---	---
	Ethridge	No	ridge	---	---	---	---
	Maltese	No	ridge	---	---	---	---
	Scairt	No	ridge	---	---	---	---
	Fleak	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
101F:							
Cabbart-Badland, outcrop complex, 6 to 70 percent slopes	Cabbart	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Boxwell	No	ridge	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Blacksheep	No	ridge	---	---	---	---
	Fleak	No	ridge	---	---	---	---
	Kirby	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Gerda	No	ridge	---	---	---	---
102B:							
Kremlin-Ethridge-Gerda complex, 1 to 6 percent slopes	Kremlin	No	alluvial fan	---	---	---	---
	Ethridge	No	alluvial fan	---	---	---	---
	Gerda	No	alluvial fan	---	---	---	---
	Maltese	No	alluvial fan	---	---	---	---
	Boxwell	No	pediment	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
103B:							
Chinook-Rhame fine sandy loams, 1 to 6 percent slopes	Chinook	No	alluvial fan	---	---	---	---
	Rhame	No	pediment	---	---	---	---
	Kremlin	No	alluvial fan	---	---	---	---
	Boxwell	No	pediment	---	---	---	---
	Chinook, moderately sloping	No	alluvial fan	---	---	---	---
	Blacksheep	No	pediment, rise	---	---	---	---
	Ethridge	No	alluvial fan	---	---	---	---
	Maltese	No	alluvial fan, alluvial flat	---	---	---	---
103D:							
Rhame-Chinook fine sandy loams, 6 to 15 percent slopes	Rhame	No	hill, ridge	---	---	---	---
	Chinook	No	hill, ridge	---	---	---	---
	Kremlin	No	hill, ridge	---	---	---	---
	Tusler	No	ridge	---	---	---	---
	Blacksheep	No	hill, ridge	---	---	---	---
	Fleak	No	hill, ridge	---	---	---	---
	Maltese	No	hill, ridge	---	---	---	---
	Burgraff	No	hill, ridge	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
103F:							
Rhame-Fleak complex, 9 to 50 percent slopes	Rhame	No	ridge	---	---	---	---
	Fleak	No	ridge	---	---	---	---
	Chinook	No	ridge	---	---	---	---
	Blacksheep	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Rhame, strongly sloping	No	ridge	---	---	---	---
	Tusler	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Rock outcrop	No	ridge	---	---	---	---
	Gerda	No	ridge	---	---	---	---
104E:							
Badland, outcrop-Patent complex, 6 to 25 percent slopes	Badland, outcrop	No	ridge	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Patent, moderately steep	No	alluvial fan	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Lonna	No	alluvial fan	---	---	---	---
	Scoria outcrop	No	ridge	---	---	---	---
	Havre	No	flood plain	---	---	---	---
105:							
Havre silt loam, 0 to 3 percent slopes	Havre	No	flood plain	---	---	---	---
	Havre, loam	No	flood plain	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Kremlin	No	stream terrace	---	---	---	---
	Wolf Point	No	flood plain	---	---	---	---
106:							
Glendive fine sandy loam, 0 to 3 percent slopes	Glendive	No	flood plain	---	---	---	---
	Hanly	No	flood plain	---	---	---	---
	Glendive, loam	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Havre	No	flood plain	---	---	---	---
107:							
Kremlin loam, 0 to 3 percent slopes	Kremlin	No	paleoterrace	---	---	---	---
	Littlemo	No	paleoterrace	---	---	---	---
	Chanta	No	paleoterrace	---	---	---	---
	Chinook	No	paleoterrace	---	---	---	---
	Haydraw	No	paleoterrace	---	---	---	---
108B:							
Hanly fine sandy loam, 0 to 6 percent slopes	Hanly	No	flood plain	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Minnewaukan	Yes	flood plain	2B3	Yes	No	No
	Riverwash	Yes	flood plain	4,2B2	Yes	Yes	No

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
109:							
Havre silt loam, wooded, 0 to 1 percent slopes	Havre, wooded	No	flood plain	---	---	---	---
	Glendive, wooded	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Wolf Point	No	flood plain	---	---	---	---
	Kremlin	No	stream terrace	---	---	---	---
	Harriet	Yes	drainageway, flood plain	2B3	Yes	No	No
110B:							
Maltese-Gerda complex, 0 to 6 percent slopes	Maltese	No	alluvial fan, alluvial flat	---	---	---	---
	Gerda	No	alluvial fan, alluvial flat	---	---	---	---
	Tanna	No	pediment	---	---	---	---
	Kremlin	No	alluvial fan, alluvial flat	---	---	---	---
	Scairt	No	pediment	---	---	---	---
	Lonna	No	alluvial fan	---	---	---	---
	Rhame	No	pediment	---	---	---	---
	Slickspots	No	alluvial fan, alluvial flat	---	---	---	---
111D:							
Gerda-Kirby complex, 1 to 15 percent slopes	Kirby	No	hill, ridge	---	---	---	---
	Scairt	No	hill, ridge	---	---	---	---
	Gerda	No	hill, ridge	---	---	---	---
	Kremlin	No	hill, ridge	---	---	---	---
	Absher	No	hill, ridge	---	---	---	---
	Maltese	No	hill, ridge	---	---	---	---
	Searing, aridic-ustic	No	hill, ridge	---	---	---	---
	Cabbart	No	hill, ridge	---	---	---	---
	Ethridge	No	hill, ridge	---	---	---	---
	Harriet	Yes	drainageway	2B3	Yes	No	No
111F:							
Kirby-Scairt complex, 9 to 70 percent slopes	Kirby	No	hill, ridge	---	---	---	---
	Scairt	No	hill, ridge	---	---	---	---
	Cabbart	No	---	---	---	---	---
	Kremlin	No	---	---	---	---	---
	Searing, aridic-ustic	No	---	---	---	---	---
	Boxwell	No	---	---	---	---	---
	Maltese	No	---	---	---	---	---
	Rhame	No	---	---	---	---	---
	Badland, outcrop	No	---	---	---	---	---
112F:							
Kirby-Badland, outcrop-Patent complex, 9 to 70 percent slopes	Kirby	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Patent, strongly sloping	No	alluvial fan	---	---	---	---
	Maltese	No	alluvial fan	---	---	---	---
	Kremlin	No	alluvial fan	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
113F:							
Lonna-Cabbart silt loams, 6 to 35 percent slopes	Lonna	No	alluvial fan	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Lonna, moderately steep	No	ridge	---	---	---	---
	Kremlin	No	alluvial fan	---	---	---	---
	Gerda	No	alluvial fan	---	---	---	---
	Blacksheep	No	ridge	---	---	---	---
	Ethridge	No	alluvial fan	---	---	---	---
	Arikara	No	ridge	---	---	---	---
114:							
Glendive and Havre soils, channeled, 0 to 3 percent slopes	Channel	No	channel, flood plain	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Havre	No	flood plain	---	---	---	---
	Hanly	No	flood plain	---	---	---	---
	Lonna	No	stream terrace	---	---	---	---
	Regan	Yes	drainageway, flood plain	2B3	Yes	No	No
115F:							
Badland, outcrop-Arikara-Cabbart complex, 15 to 70 percent slopes	Badland, outcrop	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Boxwell	No	ridge	---	---	---	---
	Lonna	No	alluvial fan, ridge	---	---	---	---
	Kirby	No	ridge	---	---	---	---
	Rhame	No	ridge	---	---	---	---
	Scairt	No	ridge	---	---	---	---
116F:							
Kremlin-Cabbart loams, slumped, 9 to 40 percent slopes	Cabbart	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Boxwell	No	---	---	---	---	---
	Scairt	No	---	---	---	---	---
	Lonna	No	---	---	---	---	---
	Badland, outcrop	No	---	---	---	---	---
	Fleak	No	---	---	---	---	---
117:							
Wolf Point silty clay loam, 0 to 1 percent slopes	Wolf Point	No	flood plain	---	---	---	---
	Havre	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Ethridge	No	stream terrace	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
118F:							
Lonna-Kirby-Cabbart complex, 3 to 50 percent slopes	Lonna	No	alluvial fan, hill, ridge	---	---	---	---
	Kirby	No	hill, ridge	---	---	---	---
	Cabbart	No	hill, ridge	---	---	---	---
	Boxwell	No	hill, ridge	---	---	---	---
	Maltese	No	hill, ridge	---	---	---	---
	Scairt	No	hill, ridge	---	---	---	---
	Scoria outcrop	No	hill, ridge	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
119F:							
Patent-Badland, outcrop-Cabbart complex, 6 to 50 percent slopes	Patent	No	alluvial fan	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Lonna	No	alluvial fan	---	---	---	---
	Gerda	No	ridge	---	---	---	---
	Kremlin	No	alluvial fan	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Kirby	No	ridge	---	---	---	---
	Maltese	No	ridge	---	---	---	---
121F:							
Maltese-Lonna-Arikara complex, 3 to 50 percent slopes	Maltese	No	ridge	---	---	---	---
	Lonna	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Scairt	No	ridge	---	---	---	---
	Tanna	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Lallie	Yes	drainageway	2B3	Yes	No	No
	Yawdim	No	ridge	---	---	---	---
127:							
Maschetah silt loam, 0 to 2 percent slopes	Maschetah	No	alluvial flat	---	---	---	---
	Cherry	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Grassna	No	---	---	---	---	---
	Belfield	No	---	---	---	---	---
	Straw	No	---	---	---	---	---
127B:							
Maschetah silt loam, 2 to 6 percent slopes	Maschetah	No	alluvial fan	---	---	---	---
	Cherry	No	---	---	---	---	---
	Golva	No	---	---	---	---	---
127C:							
Maschetah silt loam, 6 to 9 percent slopes	Maschetah	No	alluvial fan	---	---	---	---
	Cherry	No	---	---	---	---	---
	Cherry, strongly sloping	No	---	---	---	---	---
	Golva	No	---	---	---	---	---
	Maschetah, strongly sloping	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Daglum	No	---	---	---	---	---
131B:							
Lonna silt loam, 1 to 6 percent slopes	Lonna	No	alluvial fan	---	---	---	---
	Ethridge	No	alluvial fan	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Lonna, moderately sloping	No	alluvial fan	---	---	---	---
	Maltese	No	alluvial fan	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
131C:							
Lonna silt loam, 6 to 9 percent slopes	Lonna	No	alluvial fan	---	---	---	---
	Lonna, gently sloping	No	alluvial fan	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Kremlin	No	alluvial fan	---	---	---	---
	Sham	No	alluvial fan	---	---	---	---
	Cabbart	No	pediment, rise	---	---	---	---
132C:							
Patent-Gerda-Slickspots complex, 1 to 9 percent slopes	Patent	No	alluvial fan	---	---	---	---
	Gerda	No	alluvial fan, alluvial flat	---	---	---	---
	Slickspots	No	alluvial fan, alluvial flat	---	---	---	---
	Benz	No	alluvial fan	---	---	---	---
	Haydraw	No	alluvial fan	---	---	---	---
	Ethridge	No	alluvial fan	---	---	---	---
	Chinook	No	alluvial fan	---	---	---	---
	Sham	No	alluvial fan	---	---	---	---
	Yawdim	No	pediment	---	---	---	---
138E:							
Scairt-Maltese-Boxwell complex, 3 to 25 percent slopes	Scairt	No	ridge	---	---	---	---
	Maltese	No	ridge	---	---	---	---
	Gerda	No	ridge	---	---	---	---
	Boxwell	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Burgraff	No	ridge	---	---	---	---
	Rhame	No	ridge	---	---	---	---
	Yawdim	No	ridge	---	---	---	---
145F:							
Zahl-Cabba-Arikara complex, 9 to 70 percent slopes	Zahl	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Williams	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Straw	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Wabek	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
146B:							
Dooley fine sandy loam, 0 to 6 percent slopes	Dooley	No	rise	---	---	---	---
	Livona	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Flaxton	No	---	---	---	---	---
	Williams	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Lihen	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
151B:							
Boxwell-Kremlin loams, 1 to 6 percent slopes	Boxwell	No	pediment	---	---	---	---
	Kremlin	No	alluvial fan, alluvial flat	---	---	---	---
	Rhame	No	pediment	---	---	---	---
	Burgraff	No	pediment	---	---	---	---
	Chanta	No	paleoterrace	---	---	---	---
	Gerda	No	alluvial flat	---	---	---	---
	Cabbart	No	pediment, rise	---	---	---	---
151D:							
Boxwell-Kremlin loams, 6 to 15 percent slopes	Boxwell	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Kremlin, gently sloping	No	ridge	---	---	---	---
	Boxwell, gently sloping	No	ridge	---	---	---	---
	Burgraff	No	ridge	---	---	---	---
	Haydraw	No	alluvial fan	---	---	---	---
	Blacksheep	No	ridge	---	---	---	---
	Maltese	No	ridge	---	---	---	---
154F:							
Arikara-Shambo-Cabba loams, 9 to 70 percent slopes	Arikara	No	ridge	---	---	---	---
	Shambo	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Lambert	No	alluvial fan	---	---	---	---
	Chama	No	ridge	---	---	---	---
	Tally	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Daglum	No	ridge	---	---	---	---
	Regent	No	ridge	---	---	---	---
161F:							
Beisigl-Flasher-Arikara complex, 15 to 70 percent slopes	Beisigl	No	ridge	---	---	---	---
	Flasher	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Vebar	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Telfer	No	---	---	---	---	---
	Regan	Yes	drainageway	2B3	Yes	No	No
164D:							
Vebar fine sandy loam, 3 to 15 percent slopes, extremely stony	Vebar, extremely stony	No	ridge, rise	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Tally	No	---	---	---	---	---
	Williams, extremely stony	No	---	---	---	---	---
	Cohagen, extremely stony	No	---	---	---	---	---
	Rhoades	No	---	---	---	---	---
	Flaxton, very stony	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
171:							
Lohler silty clay, saline, 0 to 1 percent slopes	Lohler, moderately saline	No	flat, flood plain	---	---	---	---
	Lohler, slightly saline	No	flood plain	---	---	---	---
	Lohler, strongly saline	No	flood plain	---	---	---	---
180:							
Badland	Badland	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Scoria outcrop	No	ridge	---	---	---	---
183F:							
Badland, outcrop-Cabba complex, 9 to 70 percent slopes	Badland, outcrop	No	escarpment	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Dogtooth	No	---	---	---	---	---
	Brandenburg	No	---	---	---	---	---
	Chama	No	---	---	---	---	---
	Lambert	No	---	---	---	---	---
	Rock outcrop	No	---	---	---	---	---
187F:							
Arikara-Cabbart loams, 15 to 70 percent slopes	Arikara	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Havre	No	---	---	---	---	---
	Patent	No	---	---	---	---	---
193B:							
Chanta loam, 0 to 6 percent slopes	Chanta	No	flat, rise, paleoterrace	---	---	---	---
	Kremlin	No	---	---	---	---	---
	Tinsley	No	---	---	---	---	---
194F:							
Kirby-Arikara-Badland, outcrop complex, 15 to 70 percent slopes	Kirby	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Lonna	No	ridge	---	---	---	---
	Scairt	No	ridge	---	---	---	---
195:							
Havrelon silty clay loam, saline, 0 to 1 percent slopes	Havrelon	No	flood plain	---	---	---	---
	Trembles	No	---	---	---	---	---
	Havrelon, silty clay, moderately saline	No	---	---	---	---	---
	Scorio	No	---	---	---	---	---
	Havrelon, strongly saline	No	---	---	---	---	---
	Lohler	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
199:							
Mckeen loam, ponded, 0 to 1 percent slopes	Mckeen	Yes	flood plain, oxbow	3,4,2B3	Yes	Yes	Yes
	Mckeen, fine sandy loam	Yes	flood plain, oxbow	2B3,3,4	Yes	Yes	Yes
	Lallie	Yes	flood plain	2B3,4	Yes	Yes	No
201F:							
Badland, outcrop-Cabbart complex, 6 to 70 percent slopes	Badland, outcrop	No	ridge	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Boxwell	No	ridge	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
	Rock outcrop	No	ridge	---	---	---	---
202D:							
Boxwell-Scairt-Maltese complex, 6 to 15 percent slopes	Boxwell	No	ridge	---	---	---	---
	Scairt	No	ridge	---	---	---	---
	Maltese	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Burgraff	No	ridge	---	---	---	---
	Ethridge	No	ridge	---	---	---	---
	Lonna	No	alluvial fan	---	---	---	---
	Cabbart	No	ridge	---	---	---	---
	Yawdim	No	ridge	---	---	---	---
203D:							
Rhame-Kremlin-Maltese complex, 1 to 15 percent slopes	Rhame	No	ridge	---	---	---	---
	Chinook	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Maltese	No	ridge	---	---	---	---
	Blacksheep	No	ridge	---	---	---	---
	Boxwell	No	ridge	---	---	---	---
	Ethridge	No	ridge	---	---	---	---
	Tusler	No	ridge	---	---	---	---
	Scairt	No	ridge	---	---	---	---
	Heil	Yes	depression	2B3,3	Yes	No	Yes
203F:							
Rhame-Scairt-Kremlin complex, 15 to 35 percent slopes	Rhame	No	hill, ridge	---	---	---	---
	Scairt	No	hill, ridge	---	---	---	---
	Kremlin	No	hill, ridge	---	---	---	---
	Maltese	No	---	---	---	---	---
	Kirby	No	---	---	---	---	---
	Cabbart	No	---	---	---	---	---
	Fleak	No	---	---	---	---	---
	Badland, outcrop	No	---	---	---	---	---
205:							
Havre silt loam, 0 to 3 percent slopes rarely flooded	Havre, rarely flooded	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
206:							
Glendive fine sandy loam, 0 to 3 percent slopes, rarely flooded	Glendive, rarely flooded	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Hanly	No	flood plain	---	---	---	---
	Havre	No	flood plain	---	---	---	---
	Patent	No	alluvial fan	---	---	---	---
207:							
Harriet silt loam, low precipitation, 0 to 3 percent slopes	Harriet	Yes	alluvial flat, drainageway	2B3	Yes	No	No
	Slickspots	No	alluvial flat	---	---	---	---
	Gerda	No	alluvial flat	---	---	---	---
211F:							
Cabba-Badland, outcrop-Arikara complex, 9 to 70 percent slopes	Cabba	No	ridge	---	---	---	---
	Badland, outcrop	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Lambert	No	---	---	---	---	---
212:							
Trembles fine sandy loam, slightly wet, 0 to 2 percent slopes	Trembles	No	flood plain	---	---	---	---
	Havrelon	No	---	---	---	---	---
	Trembles, loam	No	---	---	---	---	---
	Banks	No	---	---	---	---	---
	Ridgelawn	No	---	---	---	---	---
213:							
Havrelon silt loam, slightly wet, 0 to 2 percent slopes	Havrelon, slightly wet	No	flat, flood plain, river valley	---	---	---	---
	Havrelon, silty clay loam	No	flood plain	---	---	---	---
	Lallie	Yes	flood plain	2B3	Yes	No	No
	Lohler	No	flood plain	---	---	---	---
	Trembles	No	---	---	---	---	---
214:							
Korchea loam, channeled, wooded, 0 to 2 percent slopes	Korchea, wooded	No	flood plain	---	---	---	---
	Channel	No	---	---	---	---	---
	Velva	No	---	---	---	---	---
217:							
Wolf Point silty clay loam, wooded, 0 to 1 percent slopes	Wolf Point, wooded	No	flood plain	---	---	---	---
	Havre	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Ethridge	No	stream terrace	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
218F:							
Cherry-Cabba-Brandenburg complex, 9 to 35 percent slopes	Cherry	No	alluvial fan	---	---	---	---
	Cabba	No	hill, ridge	---	---	---	---
	Brandenburg	No	hill, ridge	---	---	---	---
	Chama	No	ridge	---	---	---	---
	Maschetah	No	---	---	---	---	---
	Cherry, moderately steep	No	alluvial fan	---	---	---	---
	Cohagen	No	---	---	---	---	---
	Havrelon	No	---	---	---	---	---
	Lambert	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
227:							
Haydraw silt loam, 0 to 3 percent slopes	Haydraw	No	alluvial flat	---	---	---	---
	Floweree	No	---	---	---	---	---
	Lonna	No	---	---	---	---	---
	Glendive	No	---	---	---	---	---
227B:							
Haydraw silt loam, 3 to 6 percent slopes	Haydraw	No	alluvial fan	---	---	---	---
	Floweree	No	---	---	---	---	---
	Ethridge	No	---	---	---	---	---
	Boxwell	No	---	---	---	---	---
231C:							
Patent-Gullied land-Glendive complex, 1 to 9 percent slopes	Patent	No	alluvial fan	---	---	---	---
	Gullied land	No	alluvial fan	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Lonna	No	alluvial fan	---	---	---	---
	Hanly	No	flood plain	---	---	---	---
	Kremlin	No	alluvial fan	---	---	---	---
	Havre	No	flood plain	---	---	---	---
	Gerda	No	alluvial fan	---	---	---	---
	Ethridge	No	alluvial fan	---	---	---	---
	Sham	No	alluvial fan	---	---	---	---
232C:							
Lambert-Slickspots-Rhoades complex, 1 to 9 percent slopes	Lambert	No	alluvial fan	---	---	---	---
	Slickspots	No	alluvial fan, alluvial flat	---	---	---	---
	Rhoades	No	alluvial fan, alluvial flat	---	---	---	---
	Daglum	No	alluvial fan	---	---	---	---
	Korell	No	flood plain	---	---	---	---
	Rhoades	No	alluvial fan	---	---	---	---
238B:							
Janesburg-Dogtooth silt loams, 0 to 6 percent slopes	Janesburg	No	pediment	---	---	---	---
	Dogtooth	No	pediment	---	---	---	---
	Belfield	No	alluvial fan, alluvial flat	---	---	---	---
	Regent	No	pediment	---	---	---	---
	Janesburg, fine sandy loam	No	pediment	---	---	---	---
	Moreau	No	pediment	---	---	---	---
	Farland	No	alluvial fan, alluvial flat	---	---	---	---
	Slickspots	No	alluvial flat	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
239D:							
Vebar-Janesburg fine sandy loams, 3 to 15 percent slopes	Vebar	No	ridge	---	---	---	---
	Janesburg	No	ridge	---	---	---	---
	Tally	No	---	---	---	---	---
	Parshall	No	---	---	---	---	---
	Beisigl	No	---	---	---	---	---
	Cohagen	No	---	---	---	---	---
	Shambo	No	---	---	---	---	---
	Dogtooth	No	---	---	---	---	---
	Telfer	No	---	---	---	---	---
	Sen	No	---	---	---	---	---
242F:							
Zahl-Williams-Arikara loams, 9 to 45 percent slopes	Zahl	No	knoll, ridge, moraine	---	---	---	---
	Williams	No	knoll, ridge, moraine	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Williams, strongly sloping	No	knoll, ridge, moraine	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Rhoades	No	---	---	---	---	---
	Wabek	No	---	---	---	---	---
287F:							
Arikara-Cabba loams, 15 to 70 percent slopes	Arikara	No	ridge	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Korchea	No	---	---	---	---	---
	Lambert	No	---	---	---	---	---
299:							
Minnewaukan-Banks-Riverwash complex, 0 to 3 percent slopes	Minnewaukan	Yes	depression, flood plain, river valley	3,4,2B3	Yes	Yes	Yes
	Banks	No	flood plain, levee, river valley	---	---	---	---
	Riverwash	Yes	point bar, channel, flood plain, river valley	2B2,4	Yes	Yes	No
317:							
Lallie silty clay, 0 to 1 percent slopes	Lallie	Yes	flood plain	3,2B3	Yes	No	Yes
	Havre, frequently flooded	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
331B:							
Cherry-Gullied land-Havrelon complex, 0 to 6 percent slopes	Cherry	No	alluvial fan	---	---	---	---
	Gullied land	No	alluvial fan, channel	---	---	---	---
	Havrelon	No	flood plain	---	---	---	---
	Maschetah	No	---	---	---	---	---
	Golva	No	---	---	---	---	---
	Havrelon, frequently flooded	No	---	---	---	---	---
	Lallie	Yes	flood plain	2B3,3	Yes	No	Yes
	Cabba	No	---	---	---	---	---
	Channel	No	---	---	---	---	---
	Velva	No	---	---	---	---	---
340B:							
Niobell-Williams loams, 0 to 6 percent slopes	Niobell	No	swale	---	---	---	---
	Williams	No	rise	---	---	---	---
	Noonan	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Dooley	No	---	---	---	---	---
	Lehr	No	---	---	---	---	---
	Tonka	Yes	depression	2B3,3	Yes	No	Yes
341B:							
Noonan-Niobell-Williams loams, 0 to 6 percent slopes	Noonan	No	rise	---	---	---	---
	Niobell	No	rise	---	---	---	---
	Williams	No	rise	---	---	---	---
	Zahl	No	---	---	---	---	---
	Miranda	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
341C:							
Noonan-Williams loams, 6 to 9 percent slopes	Noonan	No	knoll, rise	---	---	---	---
	Williams	No	knoll, rise	---	---	---	---
	Niobell	No	---	---	---	---	---
	Williams, gently sloping	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Dooley	No	---	---	---	---	---
	Miranda	No	---	---	---	---	---
	Zahl	No	---	---	---	---	---
	Wabek	No	---	---	---	---	---
403F:							
Rhame-Arikara-Fleak complex, 9 to 50 percent slopes	Rhame	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Fleak	No	ridge	---	---	---	---
	Tusler	No	ridge	---	---	---	---
	Chinook	No	ridge	---	---	---	---
	Kremlin	No	ridge	---	---	---	---
	Rhame, strongly sloping	No	ridge	---	---	---	---
	Blacksheep	No	ridge	---	---	---	---
	Maltese	No	ridge	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
404F:							
Badland, outcrop-Lambert-Cabba complex, 6 to 50 percent slopes	Badland, outcrop	No	ridge	---	---	---	---
	Lambert	No	alluvial fan	---	---	---	---
	Cabba	No	ridge	---	---	---	---
	Daglum	No	ridge	---	---	---	---
	Rhoades	No	ridge	---	---	---	---
	Arikara	No	ridge	---	---	---	---
	Vebar	No	ridge	---	---	---	---
	Havrelon	No	flood plain	---	---	---	---
406:							
Glendive fine sandy loam, wooded, 0 to 3 percent slopes	Glendive, wooded	No	flood plain	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Hanly	No	flood plain	---	---	---	---
	Channel	No	channel, flood plain	---	---	---	---
	Havre	No	flood plain	---	---	---	---
408B:							
Hanly fine sandy loam, wooded, 0 to 6 percent slopes	Hanly, wooded	No	flood plain	---	---	---	---
	Hanly	No	flood plain	---	---	---	---
	Glendive	No	flood plain	---	---	---	---
	Minnewaukan	Yes	flood plain	2B3	Yes	No	No
	Riverwash	Yes	flood plain	2B2,4	Yes	Yes	No
410:							
Riverwash	Riverwash	Yes	bar, channel, flood plain	2B2,4	Yes	Yes	No
	Banks	No	---	---	---	---	---
	Minnewaukan	Yes	depression	2B3,3,4	Yes	Yes	Yes
411B:							
Lambert silt loam, 0 to 6 percent slopes	Lambert	No	alluvial fan,	---	---	---	---
	Maschetah	No	---	---	---	---	---
	Cherry	No	---	---	---	---	---
412E:							
Lambert-Brandenburg complex, 3 to 25 percent slopes	Lambert	No	alluvial fan	---	---	---	---
	Brandenburg	No	ridge	---	---	---	---
	Searing	No	---	---	---	---	---
	Daglum	No	---	---	---	---	---
	Ringling	No	---	---	---	---	---
	Rhoades	No	---	---	---	---	---
	Cherry	No	---	---	---	---	---
	Shambo	No	---	---	---	---	---
442F:							
Zahl-Williams loams, dissected, 15 to 45 percent slopes	Zahl	No	ridge	---	---	---	---
	Williams	No	ridge	---	---	---	---
	Shambo	No	---	---	---	---	---
	Bowbells	No	---	---	---	---	---
	Cabba	No	---	---	---	---	---
	Rhoades	No	---	---	---	---	---
	Wabek	No	---	---	---	---	---
	Belfield	No	---	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
460C:							
Zahl-Williams-Cabba complex, 6 to 9 percent slopes	Zahl	No	knoll, ridge	---	---	---	---
	Williams	No	knoll, ridge	---	---	---	---
	Cabba	No	knoll, ridge	---	---	---	---
	Chama	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Amor	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Noonan	No	---	---	---	---	---
460D:							
Zahl-Cabba-Williams complex, 9 to 15 percent slopes	Zahl	No	knoll, ridge	---	---	---	---
	Cabba	No	knoll, ridge	---	---	---	---
	Williams	No	knoll, ridge	---	---	---	---
	Chama	No	---	---	---	---	---
	Farnuf	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
	Flasher	No	---	---	---	---	---
	Savage	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
470C:							
Zahl-Tally-Williams complex, 6 to 9 percent slopes	Zahl	No	knoll, ridge	---	---	---	---
	Tally	No	knoll, ridge	---	---	---	---
	Williams	No	knoll, ridge	---	---	---	---
	Beisigl	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
	Cohagen	No	---	---	---	---	---
	Arnegard	No	---	---	---	---	---
	Dooley	No	---	---	---	---	---
470D:							
Zahl-Beisigl-Tally complex, 9 to 15 percent slopes	Zahl	No	knoll, ridge	---	---	---	---
	Beisigl	No	knoll, ridge	---	---	---	---
	Tally	No	knoll, ridge	---	---	---	---
	Williams	No	---	---	---	---	---
	Dooley	No	---	---	---	---	---
	Vebar	No	---	---	---	---	---
	Reeder	No	---	---	---	---	---
	Telfer	No	---	---	---	---	---
	Janesburg	No	---	---	---	---	---
490:							
Riverwash, low precipitation	Riverwash	Yes	flood plain, point bar	2B2,4	Yes	Yes	No
	Hanly	No	flood plain	---	---	---	---
	Minnewaukan	Yes	flood plain	2B3	Yes	No	No
496:							
Pits, gravel and sand, low precipitation	Pits, gravel and sand, low precipitation	No	paleoterrace, paleoterrace	---	---	---	---
	Chanta	No	paleoterrace	---	---	---	---
	Tinsley	No	paleoterrace	---	---	---	---

Hydric Soils List--Continued

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
M-W: Miscellaneous water	Miscellaneous water	No	---	---	---	---	---
W: Water	Water	No	---	---	---	---	---

HYDRIC SOILS CRITERIA CODES AND DEFINITIONS

. All Histosols except Folists, or

. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:

  a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or

  b. poorly drained or very poorly drained and have either:

     (1) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in),

         or for other soils

     (2) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or

     (3) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or

. Soils that are frequently ponded for long duration or very long duration during the growing season, or

. Soils that are frequently flooded for long duration or very long duration during the growing season.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal-unit month (AUM). The amount of forage required by one mature cow weighing approximately 1,000 pounds, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Atterberg Limits. A general term that encompasses liquid limit, plastic limit, and shrinkage limit. It is used as an integral part of several engineering classification systems.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

Badland or Badland, outcrop. Moderately steep to very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most

common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface. It may be either **lithic** (digging with a hand spade impractical) or **paralithic** (dug with difficulty with a spade).

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion.

$CaCO_3$ Equivalent. The quantity of carbonate (CO_3) in the soil expressed as $CaCO_3$. This material is important to the fertility, erosion, available water holding capacity, and genesis of a soil.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.....noncoherent when dry or moist; does not hold together in a mass.

Friable.....when moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.....when moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.....when wet, readily deformed by moderate pressure but can be pressed into a lump; will form a “wire” when rolled between thumb and forefinger.

Sticky.....when wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.....when dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.....when dry, breaks into powder or individual grains under very slight pressure.

Cemented.....hard, little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Contrasting soils (Dissimilar soils). Soils that do not share limits of diagnostic criteria, behave and perform in a similar manner, or have similar conservation needs or management requirements for the major land uses in the survey area.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized:

Excessively drained.....these soils have very high and high hydraulic conductivity and a low water-holding capacity. They are not suited to crop production unless irrigated.

Somewhat excessively drained.....these soils have high hydraulic conductivity and a low water-holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.....these soils have an intermediate water-holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.....these soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless a drainage system is installed. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.....these soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless a drainage system is installed. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained .....these soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained.....these soils are wet to the surface most of the time. The wetness prevents the growth of important crops (except rice) unless a drainage system is installed.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. An area of ground at a lower elevation than the surrounding ground and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duripan. Subsurface horizon that is characterized by cementation by silica.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capacity, normal moisture capacity, or capillary capacity.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flooding. The temporary covering of the soil surface by flowing water from any source.

Flooding frequency classes:

None	0 percent chance of flooding in any year.
Rare	0 to 5 percent chance of flooding in any year.
Occasional	5 to 50 percent chance of flooding in any year.
Frequent	more than 50 percent chance of flooding in any year.

Flooding duration classes:

Extremely brief	0.1 to 4.0 hours
Very brief	4 to 48 hours
Brief	2 to 7 days
Long	7 to 30 days
Very long	more than 30 days

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.
Footslope. The bottom of a slope or the lower part of any elevated landform.
Forb. Any herbaceous plant not a grass or a sedge.
Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.
Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.
Fragile (in tables). A soil that is easily damaged by use or disturbance.
Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.
Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
Graded stripcropping. Growing crops in strips that grade toward a protected waterway.
Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
Ground water. Water filling all the unblocked pores of the material below the water table.
Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. A gullied map unit is one that has numerous gullies.
Hardpan. A hardened or cemented soil horizon or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.
High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.
Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.
Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An

explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.....an organic layer of fresh and decaying plant residue.

A horizon.....the mineral horizon at or near the surface in which an accumulation of humidified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.....the mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.....the mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.....the mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.....Soft, consolidated bedrock beneath the soil.

Hummock. A slight mound or rise of ground above a level surface; generally of equidimensional shape and not ridge-like.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydric soil. Soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions for the upper part.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.....Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.....Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Sprinkler.....Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

K Factor. Soil erodibility factor in the Universal Soil Loss Equation.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. See saturated hydraulic conductivity.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Lime. A soil material that consists of precipitated calcium or magnesium carbonate.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance - few, common, and many; size - fine, medium, and coarse; and contrast - faint, distinct, and prominent. The size measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Mudstone. A blocky or massive, fine-grained sedimentary rock that consists of a mixture of clay, silt, and sand particles, the proportion of which vary from place to place.

Munsell notation. A designation of color by degrees of three simple variables - hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Paleoterrace. An erosional remnant of a terrace which retains the surface form and alluvial deposits of its origin but was not emplaced by, and comonly does not grade to a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, hardpan, fragipan, claypan, plowpan, and traffic pan.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. See saturated hydraulic conductivity (Ksat).

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Very brief	less than 2 days
Brief	2 to 7 days
Long	7 to 30 days
Very long	more than 30 days

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Porcelanite (scoria). Shale and clay that are fused as a result of their proximity to a burning coal vein.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the

key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma (2 or less) zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Revised Universal Soil Loss Equation (RUSLE). An erosion model designed to predict the long term average soil loss carried by runoff from specific field slopes in specified cropping and management systems.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. Exposures of bare bedrock other than lava flows and rock-lined pits. Most rock outcrops are hard rock.

Root shearing. The cutting, tearing, and disruption of plant roots by the hooves of animals during grazing when the soil is wet and soft.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline seep. Areas of nonirrigated soils with restricted drainage, where salinity has recently developed.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline-sodic soil. A soil containing a combination of soluble salts and exchangeable sodium sufficient to interfere with the growth of plants.

Salty water (in tables). Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Saturated hydraulic conductivity (Ksat). The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. Terms describing saturated hydraulic conductivity, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder slope. The uppermost inclined surface at the top of a hillside. It is the transition zone from the back slope to the summit of a hill or mountain. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silicrete. A hard siltstone that is cemented with silica.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slickspot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Level	0 to 1 percent
Level and nearly level	0 to 3 percent
Nearly level	1 to 3 percent
Gently sloping or undulating	3 to 6 percent
Moderately sloping or gently rolling	6 to 9 percent
Strongly sloping or rolling	9 to 15 percent
Moderately steep or hilly	15 to 25 percent
Steep	25 to 35 percent
Very steep	More than 35 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil depth class. The distance from the top of the soil to the underlying bedrock. The distance, in inches, is expressed as:

Very shallow	less than 10 inches
Shallow	10 to 20 inches
Moderately deep	20 to 40 inches
Deep	40 to 60 inches
Very deep	greater than 60 inches

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are - platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice

common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are - sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The lower gentle slope of a hillside. The lowest part of a foot slope.

Too arid (in tables). The soil is dry most of the time and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Universal Soil Loss Equation (USLE). An equation used to design water erosion control systems: **A—RKLSPC** where **A** is average annual soil loss in tons per acre per year; **R** is the rainfall factor; **K** is the soil erodibility factor; **L** is the length of slope; **S** is the percent slope; **P** is the conservation practice factor; and **C** is the cropping and management factor.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley. An elongated depressional area primarily developed by stream action.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Very deep soil. A soil that is more than 60 inches deep over bedrock or to other material that restricts the penetration of plant rows.

Water table. The upper surface of groundwater or that level below the surface where the soil is saturated with water. For soil survey purposes, the depth the water table is observed is within 60 inches from the surface.

Apparent.....Level at which water stands in a freshly dug, unlined borehole after it has adequate time for adjustments in the surrounding soil.

Perched.....A saturated soil zone above an unsaturated layer in the soil.

Artesian.....A water table under hydrostatic head beneath an impermeable layer.

Seasonal.....A water table within 60 inches of the surface during the growing season.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windsculptured. A land surface of which its form has been changed by action of the wind.

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GENERAL SOIL MAP
MCKENZIE COUNTY, NORTH DAKOTA

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION
NORTH DAKOTA STATE SOIL CONSERVATION COMMITTEE
NORTH DAKOTA COOPERATIVE EXTENSION SERVICE

LEGEND

- 75 — Williams-Zahl-Bowbells, level to gently rolling
- 76 — Williams-Zahl, undulating to rolling
- 77 — Williams-Temvik-Wilton-Zahl, level to rolling
- 82 — Zahl-Williams-Cabba, undulating to very steep
- 98 — Cabba-Brandenburg-Dogtooth, gently rolling to very steep
- 100 — Cabba-Dogtooth-Amor, level to very steep
- 101 — Zahl-Williams-Tally, level to rolling
- 102 — Cabba-Badland, outcrop-Cherry, level to very steep
- 103 — Cabba-Williams-Straw, level to very steep
- 105 — Chama-Golva-Cabba, nearly level to very steep
- 107 — Daglum-Belfield-Rhoades-Harriet, level to gently rolling
- 108 — Flasher-Vebar-Parshall, level to very steep
- 115 — Straw-Velva, level to undulating
- 119 — Havrelon-Lohler, level and nearly level
- 126 — Janesburg-Dogtooth-Cabba, level to very steep
- 138 — Glendive-Havre-Hanly, level to undulating
- 147 — Lambert-Cabba-Cherry, level to very steep
- 158 — Cabba-Cherry, level to very steep
- 160 — Rhame-Fleak, gently rolling to very steep
- 163 — Dooley-Zahl-Williams, level to rolling
- 169 — Zahl-Williams, undulating to very steep
- 173 — Lawther-Shambo-Savage, level to undulating
- 174 — Maschetah-Cherry, level to hilly
- 176 — Patent-Badland, outcrop-Cabbart, nearly level to very steep
- 177 — Havre-Glendive, level and nearly level
- 178 — Boxwell-Scairt-Cabbart-Rhame, level to very steep
- 179 — Lonna-Kirby-Scairt-Badland, outcrop, nearly level to very steep
- 193 — Badland, outcrop-Cabbart-Arikara, gently rolling to very steep
- 194 — Janesburg-Dogtooth, level to hilly

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

MILES 1 0 1 2 3

KILOMETERS 1 0 1 2 3 4 5 6

SCALE = 1:220000

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

INDEX TO MAP SHEETS
MCKENZIE COUNTY, NORTH DAKOTA

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

N

MILES 1 0 1 2 3

KILOMETERS 1 0 1 2 3 4 5 6

SCALE = 1:220000

SOIL LEGEND

SYMBOL	NAME
2	Heil silty clay, 0 to 1 percent slopes
3	Dimmick silty clay loam, 0 to 1 percent slopes
5	Tonka-Hamerly complex, 0 to 3 percent slopes
7	Harriet silt loam, 0 to 2 percent slopes
9	Grano silty clay, 0 to 1 percent slopes
10	Banks fine sandy loam, slightly wet, 0 to 1 percent slopes
10D	Seroco-Lohler complex, 0 to 15 percent slopes
11B	Patent loam, 1 to 6 percent slopes
12	Trembles fine sandy loam, 0 to 2 percent slopes
13	Havrelon silt loam, 0 to 2 percent slopes
14	Korchea loam, channeled, 0 to 2 percent slopes
15	Korchea loam, 0 to 2 percent slopes
16	Ridgelawn silt loam, slightly wet, 0 to 2 percent slopes
17	Lohler silty clay, slightly wet, 0 to 2 percent slopes
19	Hoffmanville silty clay, slightly wet, 0 to 2 percent slopes
20	Scorio silty clay, slightly wet, 0 to 2 percent slopes
21B	Tally-Parshall fine sandy loams, 0 to 6 percent slopes
21C	Tally-Parshall fine sandy loams, 6 to 9 percent slopes
22	Velva fine sandy loam, 0 to 2 percent slopes
23B	Lihen-Parshall complex, 0 to 6 percent slopes
23D	Beisigl-Telfer loamy fine sands, 6 to 15 percent slopes
24	Arnegard loam, 0 to 2 percent slopes
25	Farnuf loam, 0 to 2 percent slopes
25B	Farnuf loam, 2 to 6 percent slopes
25C	Farnuf loam, 6 to 9 percent slopes
26	Tansem-Roseglen silt loams, 0 to 3 percent slopes
26B	Tansem-Roseglen silt loams, 3 to 6 percent slopes
27	Golva silt loam, 0 to 2 percent slopes
27B	Golva silt loam, 2 to 6 percent slopes
27C	Golva silt loam, 6 to 9 percent slopes
29	Savage silty clay loam, 0 to 2 percent slopes
29B	Savage silty clay loam, 2 to 6 percent slopes
29C	Savage silty clay loam, 6 to 9 percent slopes
30	Lawther silty clay, 0 to 2 percent slopes
31B	Cherry silt loam, 0 to 6 percent slopes
31C	Cherry silt loam, 6 to 9 percent slopes
32F	Cherry-Cabba silt loams, 9 to 40 percent slopes
33	Belfield-Grail silty clay loams, 0 to 2 percent slopes
33B	Belfield-Savage silty clay loams, 2 to 6 percent slopes
34B	Daglum-Belfield complex, 0 to 6 percent slopes
36B	Rhoades-Daglum complex, 0 to 6 percent slopes
38B	Dogtooth-Janesburg silt loams, 0 to 6 percent slopes
38F	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes
40B	Desart-Janesburg-Ekalaka complex, 0 to 6 percent slopes
41	Williams-Bowbells loams, 0 to 3 percent slopes
41B	Williams-Bowbells loams, 3 to 6 percent slopes
42B	Williams-Zahl loams, 3 to 6 percent slopes
42C	Williams loam, 6 to 9 percent slopes
43C	Williams-Zahl loams, 6 to 9 percent slopes
44D	Zahl-Williams loams, 9 to 15 percent slopes
44E	Zahl-Williams loams, 15 to 25 percent slopes
45F	Zahl-Cabba-Maschetah complex, 3 to 70 percent slopes
46B	Dooley-Zahl complex, 3 to 6 percent slopes
46C	Dooley-Zahl complex, 6 to 9 percent slopes
46D	Dooley-Zahl complex, 9 to 15 percent slopes
48	Temvik-Wilton silt loams, 0 to 3 percent slopes
49	Temvik-Williams silt loams, 0 to 3 percent slopes
49B	Temvik-Williams silt loams, 3 to 6 percent slopes
50B	Temvik-Zahl complex, 3 to 6 percent slopes
51B	Amor-Shambo loams, 3 to 6 percent slopes
51C	Amor-Cabba loams, 6 to 9 percent slopes
51D	Amor-Cabba loams, 9 to 15 percent slopes
52B	Reeder-Farnuf loams, 3 to 6 percent slopes
52C	Reeder-Cabba loams, 6 to 9 percent slopes
53B	Chama-Sen-Cabba silt loams, 3 to 6 percent slopes
53C	Chama-Cabba-Sen silt loams, 6 to 9 percent slopes
53D	Cabba-Chama-Sen silt loams, 9 to 15 percent slopes
54F	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes
55B	Sen-Janesburg silt loams, 0 to 6 percent slopes
56B	Lefor fine sandy loam, 0 to 6 percent slopes
56C	Lefor fine sandy loam, 6 to 9 percent slopes
61D	Beisigl-Flasher loamy fine sands, 6 to 15 percent slopes
61F	Beisigl-Flasher-Tally complex, 9 to 50 percent slopes
62F	Flasher-Rock outcrop-Vebar complex, 9 to 70 percent slopes
63B	Vebar-Flasher complex, 3 to 6 percent slopes
63C	Vebar-Flasher complex, 6 to 9 percent slopes
63D	Vebar-Flasher-Tally complex, 9 to 15 percent slopes
66B	Manning fine sandy loam, 0 to 6 percent slopes
70B	Regent-Savage silty clay loams, 3 to 6 percent slopes
70C	Regent-Cabba complex, 6 to 9 percent slopes
71B	Regent-Janesburg complex, 0 to 6 percent slopes
71C	Regent-Janesburg complex, 6 to 9 percent slopes
72B	Moreau silty clay, 0 to 6 percent slopes
72C	Moreau-Wayden silty clays, 6 to 9 percent slopes
72D	Moreau-Cabba complex, 9 to 15 percent slopes
80	Badland, high precipitation
83F	Cabba-Badland, outcrop complex, 9 to 70 percent slopes
84F	Cabba-Chama-Havrelon silt loams, 3 to 70 percent slopes
88D	Brandenburg-Searing-Dogtooth complex, 6 to 15 percent slopes
88F	Brandenburg-Cabba-Dogtooth complex, 15 to 70 percent slopes
89F	Brandenburg-Cabba-Badland, outcrop complex, 9 to 70 percent slopes
90E	Manning-Schaller-Wabek complex, 6 to 25 percent slopes
91F	Wabek-Zahl complex, 9 to 35 percent slopes
93B	Lehr-Stady loams, 0 to 6 percent slopes
94B	Searing-Ringling loams, 0 to 6 percent slopes
95	Havrelon silty clay, slightly wet, 0 to 2 percent slopes
96	Pits, gravel and sand
98F	Tinsley-Chanta complex, 6 to 35 percent slopes
99	Mckeen loam, 0 to 1 percent slopes
100F	Boxwell-Cabbart-Arikara complex, 9 to 50 percent slopes
101F	Cabbart-Badland, outcrop complex, 6 to 70 percent slopes
102B	Kremlin-Ethridge-Gerda complex, 1 to 6 percent slopes
103B	Chinook-Rhame fine sandy loams, 1 to 6 percent slopes
103D	Rhame-Chinook fine sandy loams, 6 to 15 percent slopes
103F	Rhame-Fleak complex, 9 to 50 percent slopes
104E	Badland, outcrop-Patent complex, 6 to 25 percent slopes
105	Havre silt loam, 0 to 3 percent slopes
106	Glendive fine sandy loam, 0 to 3 percent slopes
107	Kremlin loam, 0 to 3 percent slopes
108B	Hanly fine sandy loam, 0 to 6 percent slopes
109	Havre silt loam, wooded, 0 to 1 percent slopes
110B	Maltese-Gerda complex, 0 to 6 percent slopes
111D	Gerda-Kirby complex, 1 to 15 percent slopes
111F	Kirby-Scairt complex, 9 to 70 percent slopes
112F	Kirby-Badland, outcrop-Patent complex, 9 to 70 percent slopes
113F	Lonna-Cabbart silt loams, 6 to 35 percent slopes
114	Glendive and Havre soils, channeled, 0 to 3 percent slopes
115F	Badland, outcrop-Arikara-Cabbart complex, 15 to 70 percent slopes
116F	Kremlin-Cabbart loams, slumped, 9 to 40 percent slopes
117	Wolf Point silty clay loam, 0 to 1 percent slopes
118F	Lonna-Kirby-Cabbart complex, 3 to 50 percent slopes
119F	Patent-Badland, outcrop-Cabbart complex, 6 to 50 percent slopes
121F	Maltese-Lonna-Arikara complex, 3 to 50 percent slopes
127	Maschetah silt loam, 0 to 2 percent slopes
127B	Maschetah silt loam, 2 to 6 percent slopes
127C	Maschetah silt loam, 6 to 9 percent slopes
131B	Lonna silt loam, 1 to 6 percent slopes
131C	Lonna silt loam, 6 to 9 percent slopes
132C	Patent-Gerda-Slickspots complex, 1 to 9 percent slopes
138E	Scairt-Maltese-Boxwell complex, 3 to 25 percent slopes
145F	Zahl-Cabba-Arikara complex, 9 to 70 percent slopes
146B	Dooley fine sandy loam, 0 to 6 percent slopes
151B	Boxwell-Kremlin loams, 1 to 6 percent slopes
151D	Boxwell-Kremlin loams, 6 to 15 percent slopes
154F	Arikara-Shambo-Cabba loams, 9 to 70 percent slopes
161F	Beisigl-Flasher-Arikara complex, 15 to 70 percent slopes
164D	Vebar fine sandy loam, 3 to 15 percent slopes, extremely stony
171	Lohler silty clay, saline, 0 to 1 percent slopes
180	Badland
183F	Badland, outcrop-Cabba complex, 9 to 70 percent slopes
187F	Arikara-Cabbart loams, 15 to 70 percent slopes
193B	Chanta loam, 0 to 6 percent slopes
194F	Kirby-Arikara-Badland, outcrop complex, 15 to 70 percent slopes
195	Havrelon silty clay loam, saline, 0 to 1 percent slopes
199	Mckeen loam, ponded, 0 to 1 percent slopes
201F	Badland, outcrop-Cabbart complex, 6 to 70 percent slopes
202D	Boxwell-Scairt-Maltese complex, 6 to 15 percent slopes
203D	Rhame-Kremlin-Maltese complex, 1 to 15 percent slopes
203F	Rhame-Scairt-Kremlin complex, 15 to 35 percent slopes
205	Havre silt loam, 0 to 3 percent slopes, rarely flooded
206	Glendive fine sandy loam, 0 to 3 percent slopes, rarely flooded
207	Harriet silt loam, low precipitation, 0 to 3 percent slopes
211F	Cabba-Badland, outcrop-Arikara complex, 9 to 70 percent slopes
212	Trembles fine sandy loam, slightly wet, 0 to 2 percent slopes
213	Havrelon silt loam, slightly wet, 0 to 2 percent slopes
214	Korchea loam, channeled, wooded, 0 to 2 percent slopes
217	Wolf Point silty clay loam, wooded, 0 to 1 percent slopes
218F	Cherry-Cabba-Brandenburg complex, 9 to 35 percent slopes
227	Haydraw silt loam, 0 to 3 percent slopes
227B	Haydraw silt loam, 3 to 6 percent slopes
231C	Patent-Gullied land-Glendive complex, 1 to 9 percent slopes
232C	Lambert-Slickspots-Rhoades complex, 1 to 9 percent slopes
238B	Janesburg-Dogtooth silt loams, 0 to 6 percent slopes
239D	Vebar-Janesburg fine sandy loams, 3 to 15 percent slopes
242F	Zahl-Williams-Arikara loams, 9 to 45 percent slopes
287F	Arikara-Cabba loams, 15 to 70 percent slopes
299	Minnewaukan-Banks-Riverwash complex, 0 to 3 percent slopes
317	Lallie silty clay, 0 to 1 percent slopes
331B	Cherry-Gullied land-Havrelon complex, 0 to 6 percent slopes
340B	Niobell-Williams loams, 0 to 6 percent slopes
341B	Noonan-Niobell-Williams loams, 0 to 6 percent slopes
341C	Noonan-Williams loams, 6 to 9 percent slopes
403F	Rhame-Arikara-Fleak complex, 9 to 50 percent slopes
404F	Badland, outcrop-Lambert-Cabba complex, 6 to 50 percent slopes
406	Glendive fine sandy loam, wooded, 0 to 3 percent slopes
408B	Hanly fine sandy loam, wooded, 0 to 6 percent slopes
410	Riverwash
411B	Lambert silt loam, 0 to 6 percent slopes
412E	Lambert-Brandenburg complex, 3 to 25 percent slopes
442F	Zahl-Williams loams, dissected, 15 to 45 percent slopes
460C	Zahl-Williams-Cabba complex, 6 to 9 percent slopes
460D	Zahl-Cabba-Williams complex, 9 to 15 percent slopes
470C	Zahl-Tally-Williams complex, 6 to 9 percent slopes
470D	Zahl-Beisigl-Tally complex, 9 to 15 percent slopes
490	Riverwash, low precipitation
496	Pits, gravel and sand, low precipitation
M-W	Miscellaneous water
W	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Reservation (national or state forest or park)
- Field sheet matchline & neatline
- Public Land Survey System Section Boundary (shown in white)
- Public Land Survey System Section Corner Tics

ROAD EMBLEM & DESIGNATIONS

- Federal (287)
- State (52)

HYDROGRAPHIC FEATURES

STREAMS

- Perennial, double line

SOIL SURVEY FEATURES

SOIL DELINEATIONS AND SYMBOLS (5 12)

LANDFORM FEATURES

- Depression, closed
- Gravel pit
- Saline spot
- Symbol included with Saline spot
- Symbol included with Closed depression

AD HOC FEATURES

- Badland (.5 to 5 acres)
- Symbol included with Badland
- Porcellanite (.5 to 5 acres)
- Symbol included with Porcellanite

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
WILLISTON EAST QUADRANGLE
SHEET NUMBER 1 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

7	8	9

7 WILLISTON SW
8 WILLISTON SE
9 LAKE JESSIE

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WILLISTON EAST, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 1 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
CUSSICKS SPRING QUADRANGLE
SHEET NUMBER 2 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

		3
10	11	12

3 RED MIKE HILL
10 CHRIS CREEK
11 BANKS
12 TOBACCO GARDEN BAY

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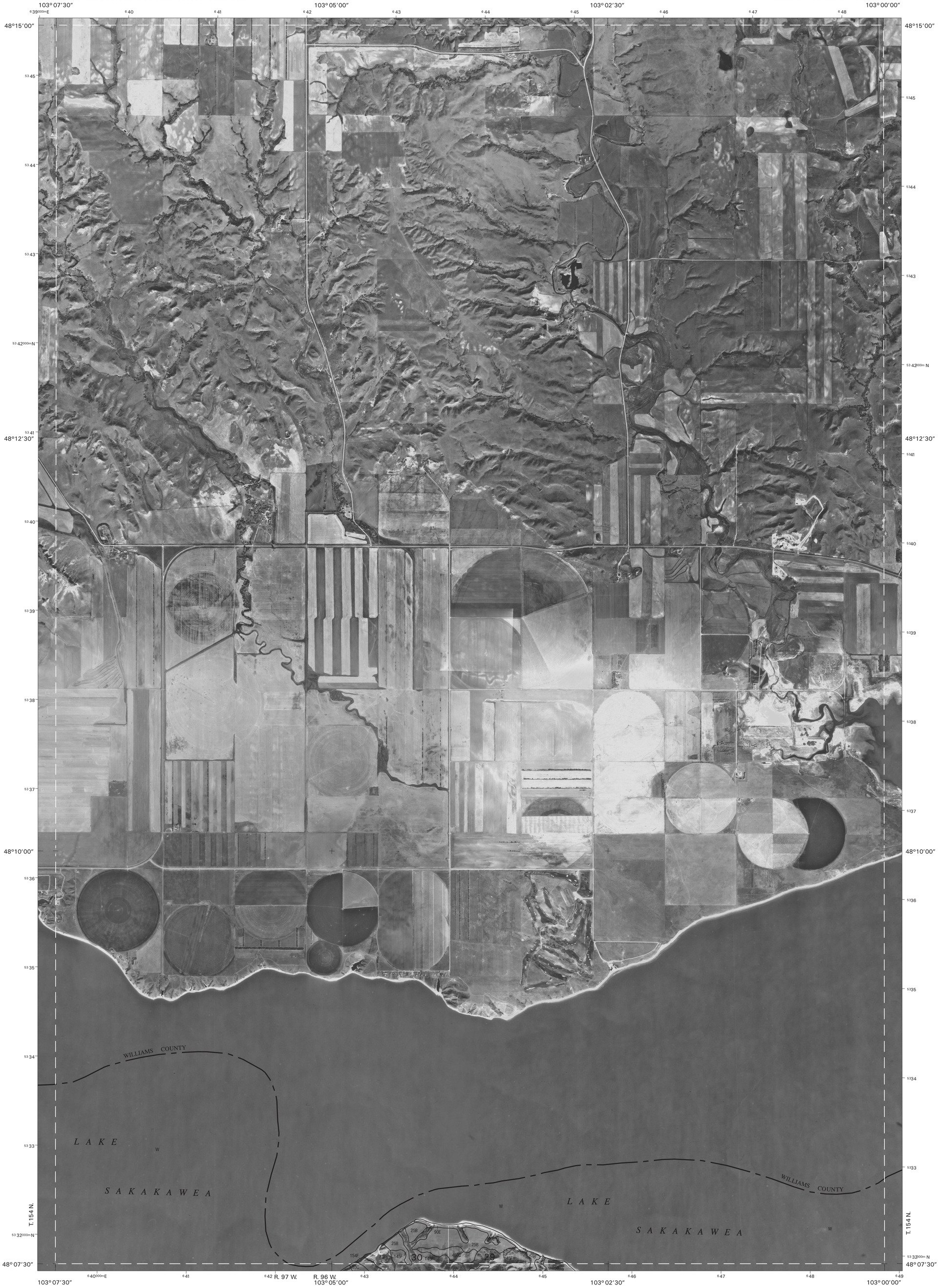
CUSSICKS SPRING, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 2 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
RED MIKE HILL QUADRANGLE
SHEET NUMBER 3 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

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2		4
11	12	13

2 CUSSICKS SPRING
4 CHARLSON NW
11 BANKS
12 TOBACCO GARDEN BAY
13 CHARLSON SW

RED MIKE HILL, NORTH DAKOTA
7.5 MINUTE SERIES
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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
CHARLSON NW QUADRANGLE
SHEET NUMBER 4 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

3		5
12	13	14

3 RED MIKE HILL
5 CHARLSON NE
12 TOBACCO GARDEN BAY
13 CHARLSON SW
14 CHARLSON

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CHARLSON NW, NORTH DAKOTA
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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
CHARLSON NE QUADRANGLE
SHEET NUMBER 5 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

			4 CHARLSON NW
4			13 CHARLSON SW
			14 CHARLSON
13	14	15	15 RAT LAKE SW

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MCKENZIE COUNTY, NORTH DAKOTA
TRENTON QUADRANGLE
SHEET NUMBER 6 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

		7
18	19	20

7 WILLISTON SW
18 BUFORD
19 CARTWRIGHT NE
20 CAMP CREEK WEST
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MCKENZIE COUNTY, NORTH DAKOTA
WILLISTON SW QUADRANGLE
SHEET NUMBER 7 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

		1
6		8
19	20	21

1 WILLISTON EAST
6 TRENTON
8 WILLISTON SE
19 CARTWRIGHT NE
20 CAMP CREEK WEST
21 CAMP CREEK EAST

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WILLISTON SW, NORTH DAKOTA

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UNITED STATES
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MCKENZIE COUNTY, NORTH DAKOTA
WILLISTON SE QUADRANGLE
SHEET NUMBER 8 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

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1 WILLISTON EAST
7 WILLISTON SW
9 LAKE JESSIE
20 CAMP CREEK WEST
21 CAMP CREEK EAST
22 WATFORD CITY NW

WILLISTON SE, NORTH DAKOTA
7.5 MINUTE SERIES
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MCKENZIE COUNTY, NORTH DAKOTA
LAKE JESSIE QUADRANGLE
SHEET NUMBER 9 OF 80

103°30′00″ 612 000mE 13 14 103°27′30″ 15 16 17 103°25′00″ 18 19 20 103°22′30″ 21

48°07′30″ 5331 5330 5329 53 28 000m N 5327 48°05′00″ 5326 5325 5324 5323 48°02′30″ 5322 5321 T. 153 N. 5320 T. 152 N. 5319 53 18 000m N 48°00′00″

L A K E S A K A K A W E A

WILLIAMS COUNTY

WILLIAMS COUNTY

R. 100 W. R. 99 W.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

1		
8		10
21	22	23

1 WILLISTON EAST
8 WILLISTON SE
10 CHRIS CREEK
21 CAMP CREEK EAST
22 WATFORD CITY NW
23 WATFORD CITY NE

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LAKE JESSIE, NORTH DAKOTA
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UNITED STATES
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MCKENZIE COUNTY, NORTH DAKOTA
CHRIS CREEK QUADRANGLE
SHEET NUMBER 10 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

		2
9		11
22	23	24

2 CUSSICKS SPRING
9 LAKE JESSIE
11 BANKS
22 WATFORD CITY NW
23 WATFORD CITY NE
24 TIMBER PRONG CREEK

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CHRIS CREEK, NORTH DAKOTA

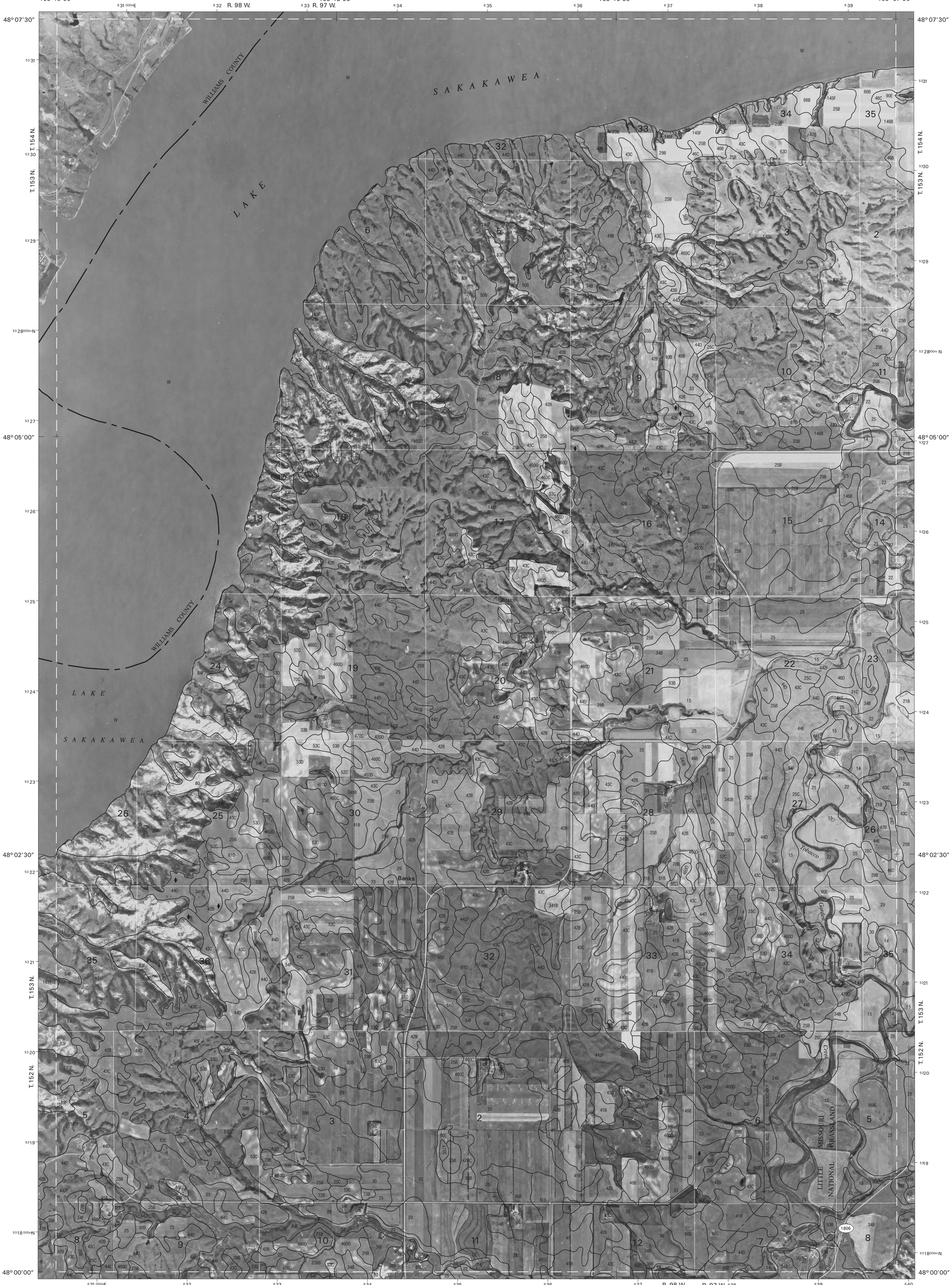
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
BANKS QUADRANGLE
SHEET NUMBER 11 OF 80

103°15′00″ 103°12′30″ 103°10′00″ 103°07′30″
48°07′30″ 48°05′00″ 48°02′30″ 48°00′00″
R. 98 W. R. 97 W.
T. 154 N. T. 153 N. T. 152 N.



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

	2	3
10		12
23	24	25

2 CUSSICKS SPRING
3 RED MIKE HILL
10 CHRIS CREEK
12 TOBACCO GARDEN BAY
23 WATFORD CITY NE
24 TIMBER PRONG CREEK
25 DEMICKS LAKE

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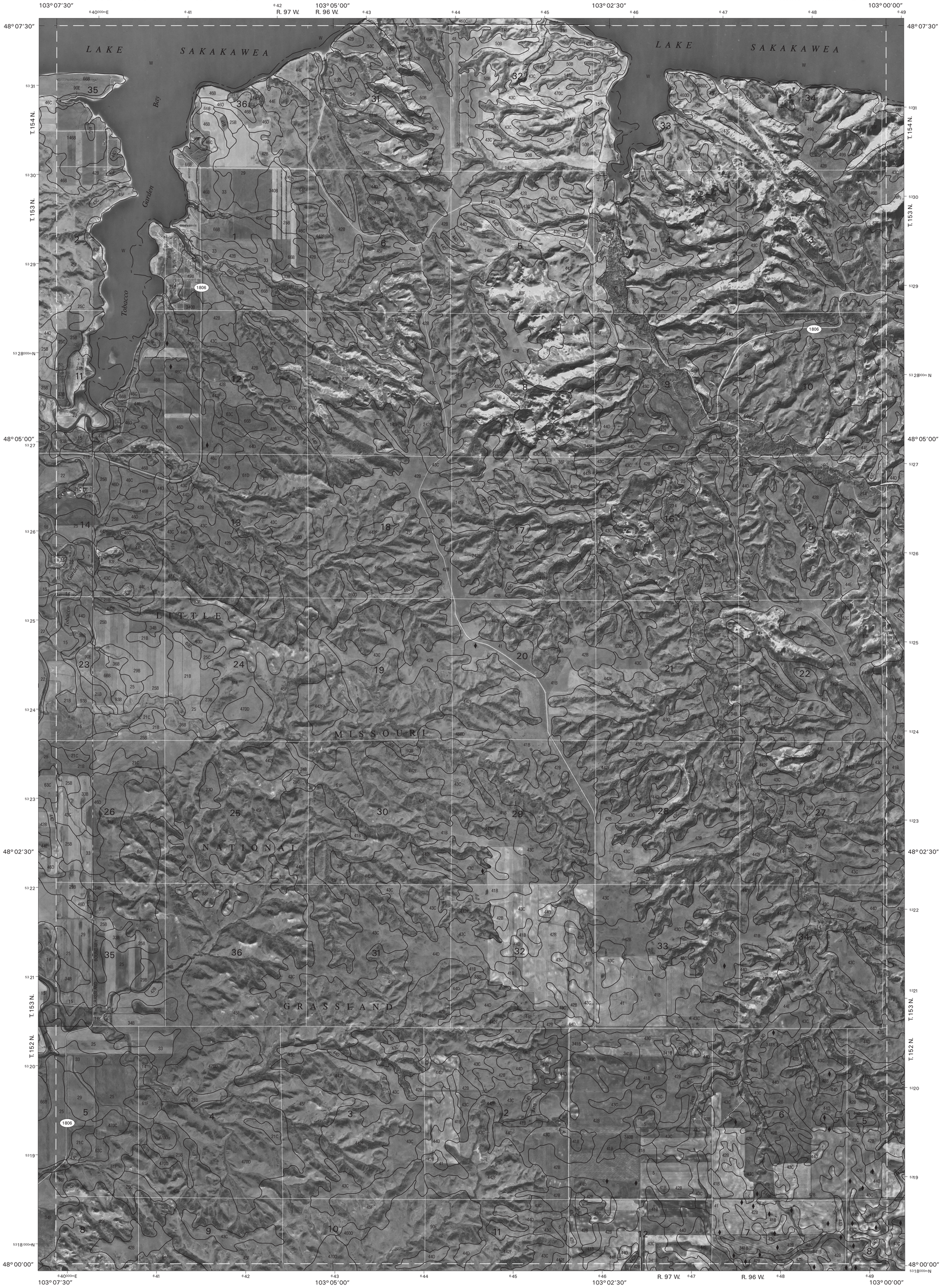
BANKS, NORTH DAKOTA

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
TOBACCO GARDEN BAY QUADRANGLE
SHEET NUMBER 12 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

2	3	4
11		13
24	25	26

2 CUSSICKS SPRING
3 RED MIKE HILL
4 CHARLSON NW
11 BANKS
13 CHARLSON SW
24 TIMBER PRONG CREEK
25 DEMICKS LAKE
26 KEENE

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TOBACCO GARDEN BAY, NORTH DAKOTA

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
CHARLSON SW QUADRANGLE
SHEET NUMBER 13 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

3	4	5
12		14
25	26	27

3 RED MIKE HILL
4 CHARLSON NW
5 CHARLSON NE
12 TOBACCO GARDEN BAY
14 CHARLSON
25 DEMICKS LAKE
26 KEENE
27 BLUE BUTTES

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MCKENZIE COUNTY, NORTH DAKOTA
CHARLSON QUADRANGLE
SHEET NUMBER 14 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

		4 CHARLSON NW 5 CHARLSON NE
13		13 CHARLSON SW 15 RAT LAKE SW 26 KEENE 27 BLUE BUTTES 28 SANISH NW
26	27	28

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UNITED STATES
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MCKENZIE COUNTY, NORTH DAKOTA
RAT LAKE SW QUADRANGLE
SHEET NUMBER 15 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

5			5 CHARLSON NE
14		16	14 CHARLSON 16 RAT LAKE SE 27 BLUE BUTTES 28 SANISH NW 29 SANISH
27	28	29	

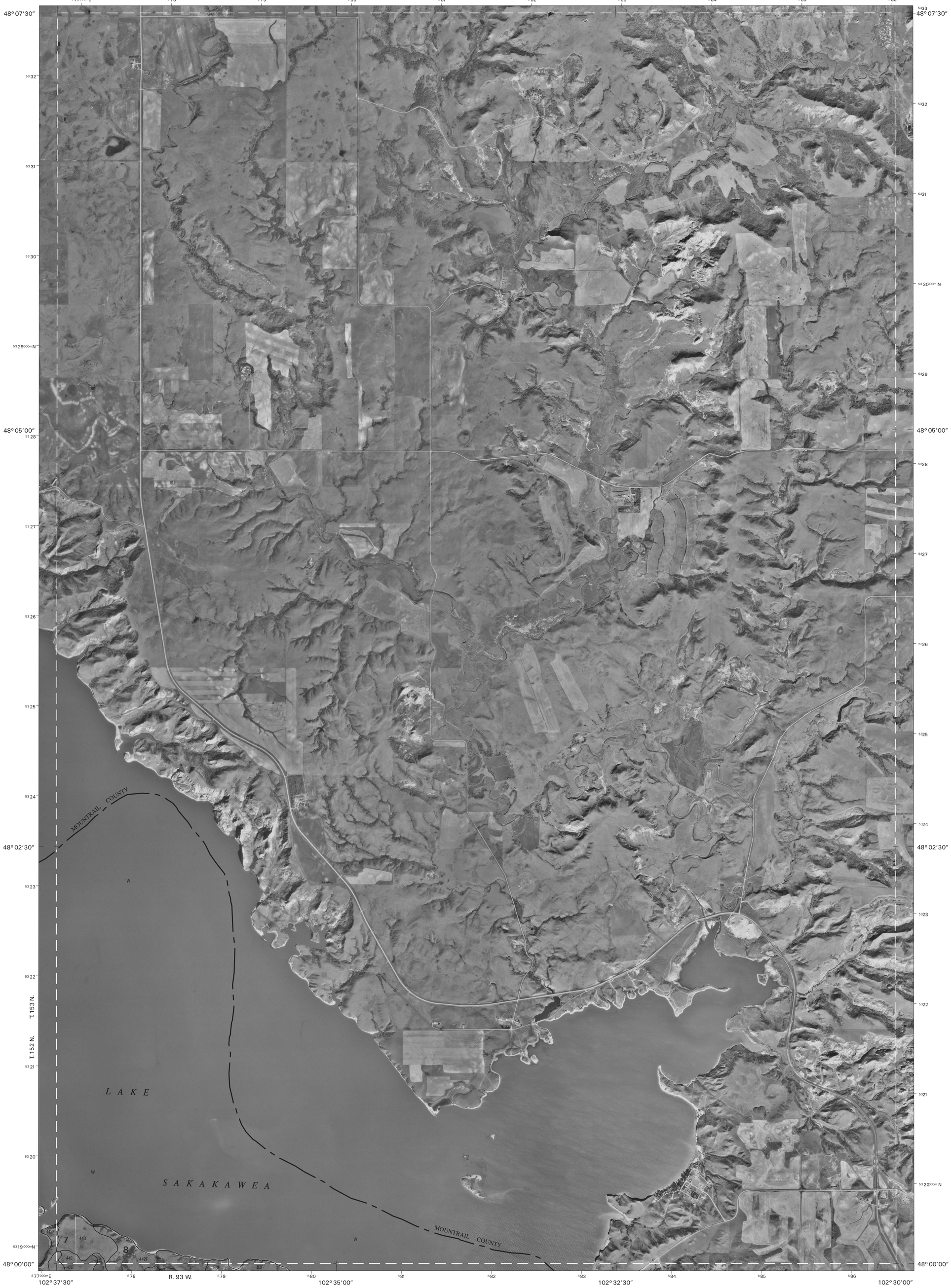
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MCKENZIE COUNTY, NORTH DAKOTA
RAT LAKE SE QUADRANGLE
SHEET NUMBER 16 OF 80



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NORTH

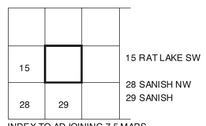
QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS



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RAT LAKE SE, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
DORE QUADRANGLE
SHEET NUMBER 17 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

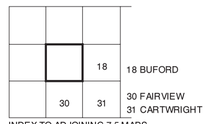
QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS



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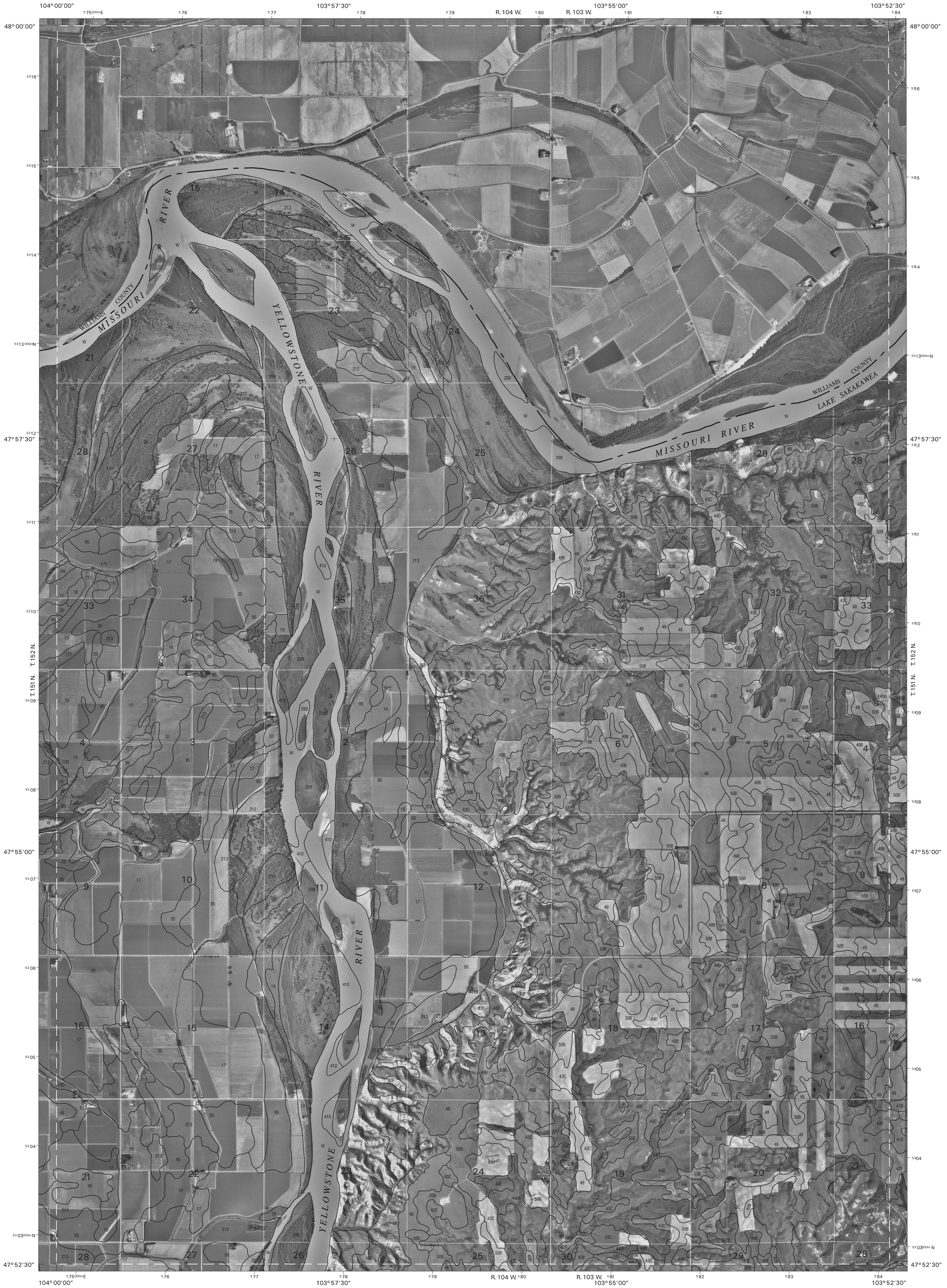
DORE, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
BUFORD QUADRANGLE
SHEET NUMBER 18 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

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		6
17		19
30	31	32

6 TRENTON
17 DORE
19 CARTWRIGHT NE
30 FAIRVIEW
31 CARTWRIGHT
32 CHARBONNEAU

BUFORD, NORTH DAKOTA
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MCKENZIE COUNTY, NORTH DAKOTA
CARTWRIGHT NE QUADRANGLE
SHEET NUMBER 19 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

	6	7
18		20
31	32	33

6 TRENTON
7 WILLISTON SW
18 BUFORD
20 CAMP CREEK WEST
31 CARTWRIGHT
32 CHARBONNEAU
33 ALEXANDER

INDEX TO ADJOINING 7.5 MAPS

CARTWRIGHT NE, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 19 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
CAMP CREEK WEST QUADRANGLE
SHEET NUMBER 20 OF 80

103°45′00″ 103°42′30″ 103°40′00″ 103°37′30″

48°00′00″ 47°57′30″ 47°55′00″ 47°52′30″

R. 102 W. R. 101 W.

T. 152 N.
T. 151 N.

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

6	7	8
19		21
32	33	34

6 TRENTON
7 WILLISTON SW
8 WILLISTON SE
19 CARTWRIGHT NE
21 CAMP CREEK EAST
32 CHARBONNEAU
33 ALEXANDER
34 RAWSON

INDEX TO ADJOINING 7.5 MAPS

CAMP CREEK WEST, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 20 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
CAMP CREEK EAST QUADRANGLE
SHEET NUMBER 21 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

7	8	9
20		22
33	34	35

7 WILLISTON SW
8 WILLISTON SE
9 LAKE JESSIE
20 CAMP CREEK WEST
22 WATFORD CITY NW
33 ALEXANDER
34 RAWSON
35 ARNEGARD

INDEX TO ADJOINING 7.5 MAPS

CAMP CREEK EAST, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 21 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
WATFORD CITY NW QUADRANGLE
SHEET NUMBER 22 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

8	9	10
21		23
34	35	36

8 WILLISTON SE
9 LAKE JESSIE
10 CHRIS CREEK
21 CAMP CREEK EAST
23 WATFORD CITY NE
34 RAWSON
35 ARNEGARD
36 WATFORD CITY

INDEX TO ADJOINING 7.5 MAPS

WATFORD CITY NW, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 22 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
WATFORD CITY NE QUADRANGLE
SHEET NUMBER 23 OF 80

103°22′30″ 103°20′00″ 103°17′30″ 103°15′00″
48°00′00″ 47°57′30″ 47°55′00″ 47°52′30″
R. 99 W. R. 98 W.
T. 152 N. T. 151 N.
622000mE 623 624 625 626 627 628 629 630 631
5317 5316 5315 514000mN 5313 5312 5311 5310 5309 5308 5307 5306 5305 504000mN



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

9	10	11
22		24
35	36	37

9 LAKE JESSIE
10 CHRIS CREEK
11 BANKS
22 WATFORD CITY NW
24 TIMBER PRONG CREEK
35 ARNEGARD
36 WATFORD CITY
37 SCHAFER

INDEX TO ADJOINING 7.5 MAPS

WATFORD CITY NE, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 23 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
TIMBER PRONG CREEK QUADRANGLE
SHEET NUMBER 24 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

10	11	12
23		25
36	37	38

10 CHRIS CREEK
11 BANKS
12 TOBACCO GARDEN BAY
23 WATFORD CITY NE
25 DEMICKS LAKE
36 WATFORD CITY
37 SCHAFER
38 SCHAFER SE

INDEX TO ADJOINING 7.5 MAPS

TIMBER PRONG CREEK, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 24 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
DEMICKS LAKE QUADRANGLE
SHEET NUMBER 25 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

11	12	13	11 BANKS 12 TOBACCO GARDEN BAY 13 CHARLSON SW
24		26	24 TIMBER PRONG CREEK 26 KEENE
37	38	39	37 SCHAFER 38 SCHAFER SE 39 JOHNSONS CORNER

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DEMICKS LAKE, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 25 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
KEENE QUADRANGLE
SHEET NUMBER 26 OF 80

103°00′00″ 102°57′30″ 102°55′00″ 102°52′30″
48°00′00″ 47°57′30″ 47°55′00″ 47°52′30″
R. 96 W. R. 95 W.
T. 152 N. T. 151 N.
6 49 000m E 6 50 6 51 6 52 6 53 6 54 6 55 6 56 6 57 6 58 6 59
5318 5317 5316 5315 000m N 5314 5313 5312 5311 5310 5309 5308 5307 5306 5305 000m N

LITTLE MISSOURI NATIONAL GRASSLAND
BOUNDARY
Keene
Clear Creek
Stony Butte
Blue Buttes
1806

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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

12	13	14
25		27
38	39	40

12 TOBACCO GARDEN BAY
13 CHARLSON SW
14 CHARLSON
25 DEMICKS LAKE
27 BLUE BUTTES
38 SCHAFER SE
39 JOHNSONS CORNER
40 BLUE BUTTES SE

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KEENE, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 26 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
BLUE BUTTES QUADRANGLE
SHEET NUMBER 27 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

13	14	15	13 CHARLSON SW 14 CHARLSON 15 RAT LAKE SW
26		28	26 KEENE 28 SANISH NW
39	40	41	39 JOHNSONS CORNER 40 BLUE BUTTES SE 41 SANISH SW

INDEX TO ADJOINING 7.5 MAPS

BLUE BUTTES, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 27 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
SANISH NW QUADRANGLE
SHEET NUMBER 28 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

14	15	16	14 CHARLSON 15 RAT LAKE SW 16 RAT LAKE SE
27		29	27 BLUE BUTTES 29 SANISH
40	41		40 BLUE BUTTES SE 41 SANISH SW

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SANISH NW, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 28 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
SANISH QUADRANGLE
SHEET NUMBER 29 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

INDEX TO ADJOINING 7.5 MAPS

15 RAT LAKE SW
16 RAT LAKE SE
28 SANISH NW
41 SANISH SW

SANISH, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 29 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
FAIRVIEW QUADRANGLE
SHEET NUMBER 30 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

	17	18	17 DORE 18 BUFORD
		31	31 CARTWRIGHT
	42	43	42 SIDNEY NE 43 HORSE CREEK SCHOOL

INDEX TO ADJOINING 7.5 MAPS

FAIRVIEW, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 30 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
CARTWRIGHT QUADRANGLE
SHEET NUMBER 31 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

17	18	19
30		32
42	43	44

17 DORE
18 BUFORD
19 CARTWRIGHT NE
30 FAIRVIEW
32 CHARBONNEAU
42 SIDNEY NE
43 HORSE CREEK SCHOOL
44 SATHER LAKE

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CARTWRIGHT, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 31 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
CHARBONNEAU QUADRANGLE
SHEET NUMBER 32 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

18	19	20
31		33
43	44	45

18 BUFORD
19 CARTWRIGHT NE
20 CAMP CREEK WEST
31 CARTWRIGHT
33 ALEXANDER
43 HORSE CREEK SCHOOL
44 SATHER LAKE
45 MOLINE SCHOOL

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CHARBONNEAU, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 32 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
ALEXANDER QUADRANGLE
SHEET NUMBER 33 OF 80

103° 45′ 00″ — 103° 42′ 30″ — 103° 40′ 00″ — 103° 37′ 30″
47° 52′ 30″ — 47° 50′ 00″ — 47° 47′ 30″ — 47° 45′ 00″
R. 102 W. — R. 101 W.
T. 151 N. — T. 150 N. — T. 149 N.
5 94 000m E — 5 95 — 5 96 — 5 97 — 5 98 — 5 99 — 6 00 — 6 01 — 6 02 — 6 03
5 2 99 000m N — 5 2 90 000m N



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

19	20	21	19 CARTWRIGHT NE 20 CAMP CREEK WEST 21 CAMP CREEK EAST
32		34	32 CHARBONNEAU 34 RAWSON
44	45	46	44 SATHER LAKE 45 MOLINE SCHOOL 46 BEAR BUTTE

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ALEXANDER, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 33 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
RAWSON QUADRANGLE
SHEET NUMBER 34 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

20	21	22
33		35
45	46	47

20 CAMP CREEK WEST
21 CAMP CREEK EAST
22 WATFORD CITY NW
33 ALEXANDER
35 ARNEGARD
45 MOLINE SCHOOL
46 BEAR BUTTE
47 STOCKE BUTTE

INDEX TO ADJOINING 7.5 MAPS

RAWSON, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 34 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
ARNEGARD QUADRANGLE
SHEET NUMBER 35 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

21	22	23	21 CAMP CREEK EAST 22 WATFORD CITY NW 23 WATFORD CITY NE
34		36	34 RAWSON 36 WATFORD CITY
46	47	48	46 BEAR BUTTE 47 STOCKE BUTTE 48 TEPEE BUTTES

INDEX TO ADJOINING 7.5 MAPS

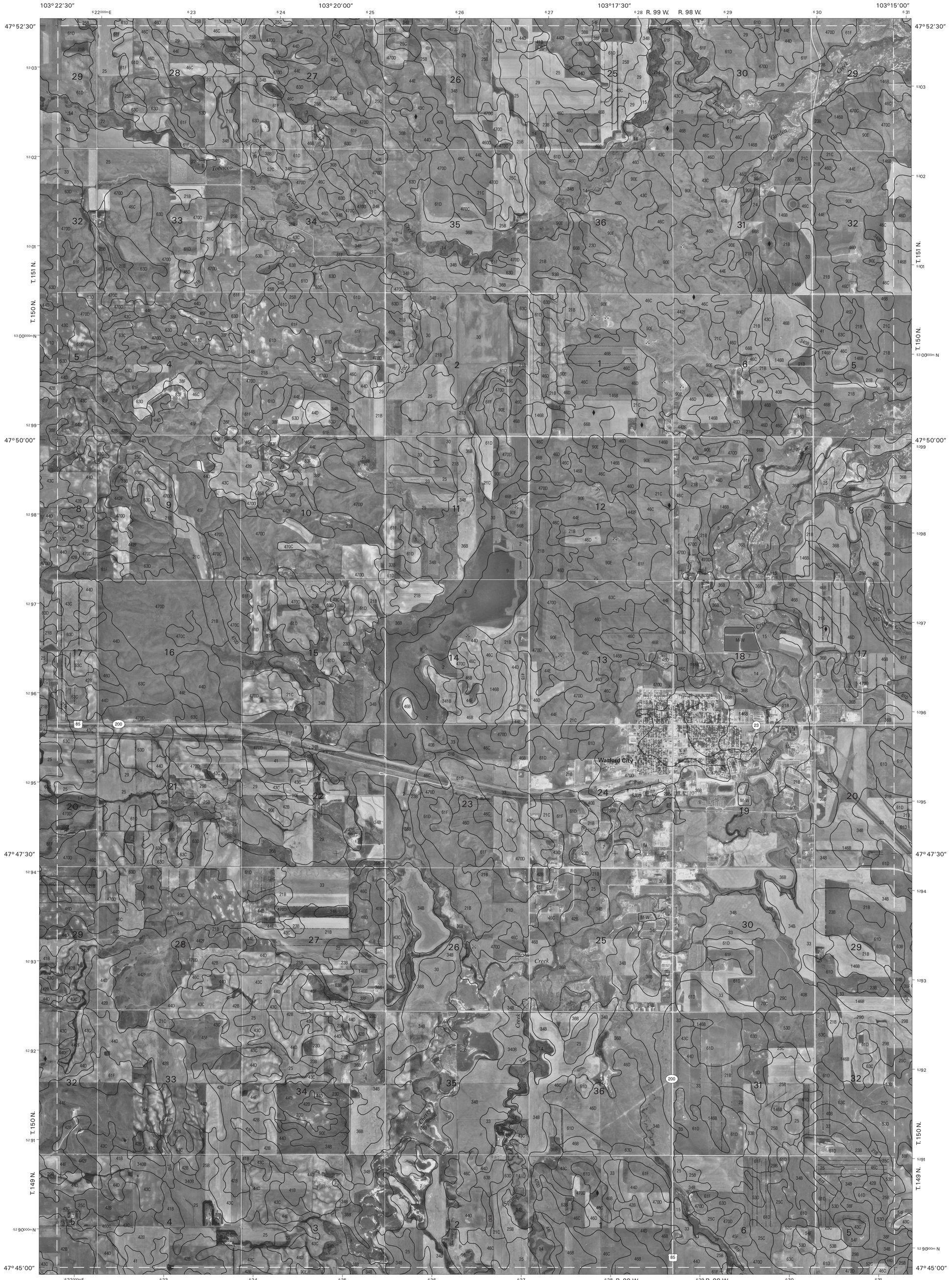
ARNEGARD, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 35 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
WATFORD CITY QUADRANGLE
SHEET NUMBER 36 OF 80


103°22′30″
103°20′00″
103°17′30″
103°15′00″
R. 99 W.
R. 98 W.
47°52′30″
47°50′00″
47°47′30″
47°45′00″
T. 151 N.
T. 150 N.
T. 149 N.
Watford City
Tobacco Garden Creek
Square Butte Creek
Charley Creek
Spring Creek
Cherry Creek
Little Beaver Creek
Beaver Creek
Big Gully
Little Gully
Deep Coulee
Dry Coulee
Hay Coulee
Rocky Coulee
Sand Coulee
Stony Coulee
Willow Creek
Wolf Creek
Woody Coulee
Yellow Creek
Yellow Dog Creek
Zahl Coulee
Zahl Creek
Zenith Coulee
Zenith Creek
Zero Coulee
Zero Creek
Zimmerman Coulee
Zimmerman Creek
Zinc Coulee
Zinc Creek
Zion Coulee
Zion Creek
Zirconium Coulee
Zirconium Creek
Zodiac Coulee
Zodiac Creek
Zoo Coulee
Zoo Creek
Zoology Coulee
Zoology Creek
Zoom Coulee
Zoom Creek
Zoomorphic Coulee
Zoomorphic Creek
Zoonotic Coulee
Zoonotic Creek
Zoophilic Coulee
Zoophilic Creek
Zoophobic Coulee
Zoophobic Creek
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
SCHAFER QUADRANGLE
SHEET NUMBER 37 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

23	24	25	23 WATFORD CITY NE 24 TIMBER PRONG CREEK 25 DEMICKS LAKE
36		38	36 WATFORD CITY 38 SCHAFER SE
48	49	50	48 TEPEE BUTTES 49 LONE BUTTE NW 50 LONE BUTTE NE

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SCHAFER, NORTH DAKOTA
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SHEET NUMBER 37 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

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DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
SCHAFER SE QUADRANGLE
SHEET NUMBER 38 OF 80

103° 07′ 30″ — 103° 05′ 00″ — 103° 02′ 30″ — 103° 00′ 00″
47° 52′ 30″ — 47° 50′ 00″ — 47° 47′ 30″ — 47° 45′ 00″
R. 97 W. — R. 96 W.
T. 151 N. — T. 150 N. — T. 149 N.



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

24	25	26
37		39
49	50	51

24 TIMBER PRONG CREEK
25 DEMICKS LAKE
26 KEENE
37 SCHAFER
39 JOHNSONS CORNER
49 LONE BUTTE NW
50 LONE BUTTE NE
51 CROFF

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DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
JOHNSONS CORNER QUADRANGLE
SHEET NUMBER 39 OF 80

103°00′00″ 102°57′30″ 102°55′00″ 102°52′30″
47°52′30″ 47°50′00″ 47°47′30″ 47°45′00″
R. 96 W. R. 95 W.
T. 151 N. T. 150 N. T. 149 N.

Johnsons Corner
Saddle Butte
Little Missouri National Grassland
Blue Buttes
Dry Creek
Kummer Ridge

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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

INDEX TO ADJOINING 7.5 MAPS

25	26	27
38		40
50	51	52

25 DEMICKS LAKE
26 KEENE
27 BLUE BUTTES
38 SCHAFER SE
40 BLUE BUTTES SE
50 LONE BUTTE NE
51 CROFF
52 FIGURE 4 RANCH

JOHNSONS CORNER, NORTH DAKOTA
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

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MCKENZIE COUNTY, NORTH DAKOTA
BLUE BUTTES SE QUADRANGLE
SHEET NUMBER 40 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

26	27	28	26 KEENE 27 BLUE BUTTES 28 SANISH NW
39		41	39 JOHNSONS CORNER 41 SANISH SW
51	52	53	51 CROFF 52 FIGURE 4 RANCH 53 MANDAREE

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BLUE BUTTES SE, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
SANISH SW QUADRANGLE
SHEET NUMBER 41 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

27	28	29
40		
52	53	

27 BLUE BUTTES
28 SANISH NW
29 SANISH
40 BLUE BUTTES SE
52 FIGURE 4 RANCH
53 MANDAREE

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MCKENZIE COUNTY, NORTH DAKOTA
SIDNEY NE QUADRANGLE
SHEET NUMBER 42 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

	30	31
	43	
	54	55

30 FAIRVIEW
31 CARTWRIGHT
43 HORSE CREEK SCHOOL
54 SIDNEY SE
55 PHILLIP SPRING

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MCKENZIE COUNTY, NORTH DAKOTA
HORSE CREEK SCHOOL QUADRANGLE
SHEET NUMBER 43 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

30	31	32
42		44
54	55	56

30 FAIRVIEW
31 CARTWRIGHT
32 CHARBONNEAU
42 SIDNEY NE
44 SATHER LAKE
54 SIDNEY SE
55 PHILLIP SPRING
56 SHEEP CREEK

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HORSE CREEK SCHOOL, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
SATHER LAKE QUADRANGLE
SHEET NUMBER 44 OF 80

103°52′30″ 103°50′00″ 103°47′30″ 103°45′00″
47°45′00″ 47°42′30″ 47°40′00″ 47°37′30″
R. 104 W. R. 103 W. R. 102 W.
T. 149 N. T. 148 N.

Johnson Creek · Vanderhoof Coulee · Little Missouri National Grassland · Horse Creek · Alkali Creek · Sheep Butte · Grassland Boundary · Charbonneau Creek

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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

31	32	33
43		45
55	56	57

INDEX TO ADJOINING 7.5 MAPS

31 CARTWRIGHT
32 CHARBONNEAU
33 ALEXANDER
43 HORSE CREEK SCHOOL
45 MOLINE SCHOOL
55 PHILLIP SPRING
56 SHEEP CREEK
57 BURNING MINE BUTTE

SATHER LAKE, NORTH DAKOTA
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MCKENZIE COUNTY, NORTH DAKOTA
MOLINE SCHOOL QUADRANGLE
SHEET NUMBER 45 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

32	33	34
44		46
56	57	58

32 CHARBONNEAU
33 ALEXANDER
34 RAWSON
44 SATHER LAKE
46 BEAR BUTTE
56 SHEEP CREEK
57 BURNING MINE BUTTE
58 RED WING CREEK

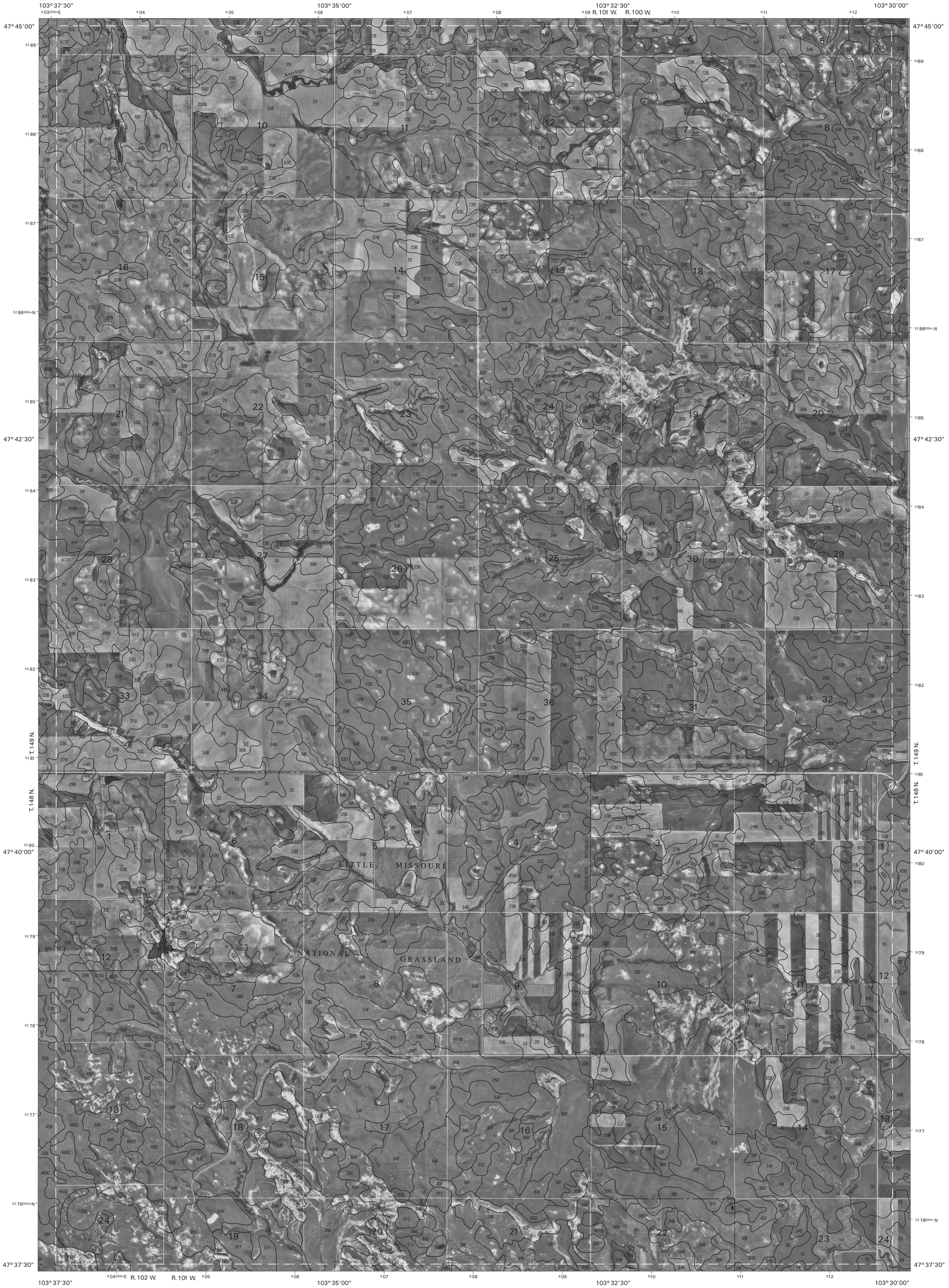
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MCKENZIE COUNTY, NORTH DAKOTA
BEAR BUTTE QUADRANGLE
SHEET NUMBER 46 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

33	34	35
45		47
57	58	59

33 ALEXANDER
34 RAWSON
35 ARNEGARD
45 MOLINE SCHOOL
47 STOCKE BUTTE
57 BURNING MINE BUTTE
58 RED WING CREEK
59 SPERATI POINT

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MCKENZIE COUNTY, NORTH DAKOTA
STOCKE BUTTE QUADRANGLE
SHEET NUMBER 47 OF 80

103°30′00″ 103°27′30″ 103°25′00″ 103°22′30″

47°45′00″ 47°42′30″ 47°40′00″ 47°37′30″

R. 101 W. R. 100 W. R. 99 W.

T. 149 N. T. 148 N.

Creek Cherry Creek Wins Red Cherry

Stocke Butte

GRASSLAND BOUNDARY

THEODORE ROOSEVELT NATIONAL PARK

NATIONAL GRASSLAND

LITTLE MISSOURI

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

34	35	36
46		48
58	59	60

34 RAWSON
35 ARNEGARD
36 WATFORD CITY
46 BEAR BUTTE
48 TEPEE BUTTES
58 RED WING CREEK
59 SPERATI POINT
60 LONG X DIVIDE

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
TEPEE BUTTES QUADRANGLE
SHEET NUMBER 48 OF 80

103°22′30″ 103°20′00″ 103°17′30″ 103°15′00″
47°45′00″ 47°42′30″ 47°40′00″ 47°37′30″
R. 100 W. R. 99 W. R. 98 W.
T. 149 N. T. 148 N.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

35	36	37
47		49
59	60	61

35 ARNEGARD
36 WATFORD CITY
37 SCHAFER
47 STOCKE BUTTE
49 LONE BUTTE NW
59 SPERATI POINT
60 LONG X DIVIDE
61 LONE BUTTE

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TEPEE BUTTES, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 48 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
LONE BUTTE NW QUADRANGLE
SHEET NUMBER 49 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

36	37	38	36 WATFORD CITY 37 SCHAFER 38 SCHAFER SE
48		50	48 TEPEE BUTTES 50 LONE BUTTE NE
60	61	62	60 LONG X DIVIDE 61 LONE BUTTE 62 LONE BUTTE SE

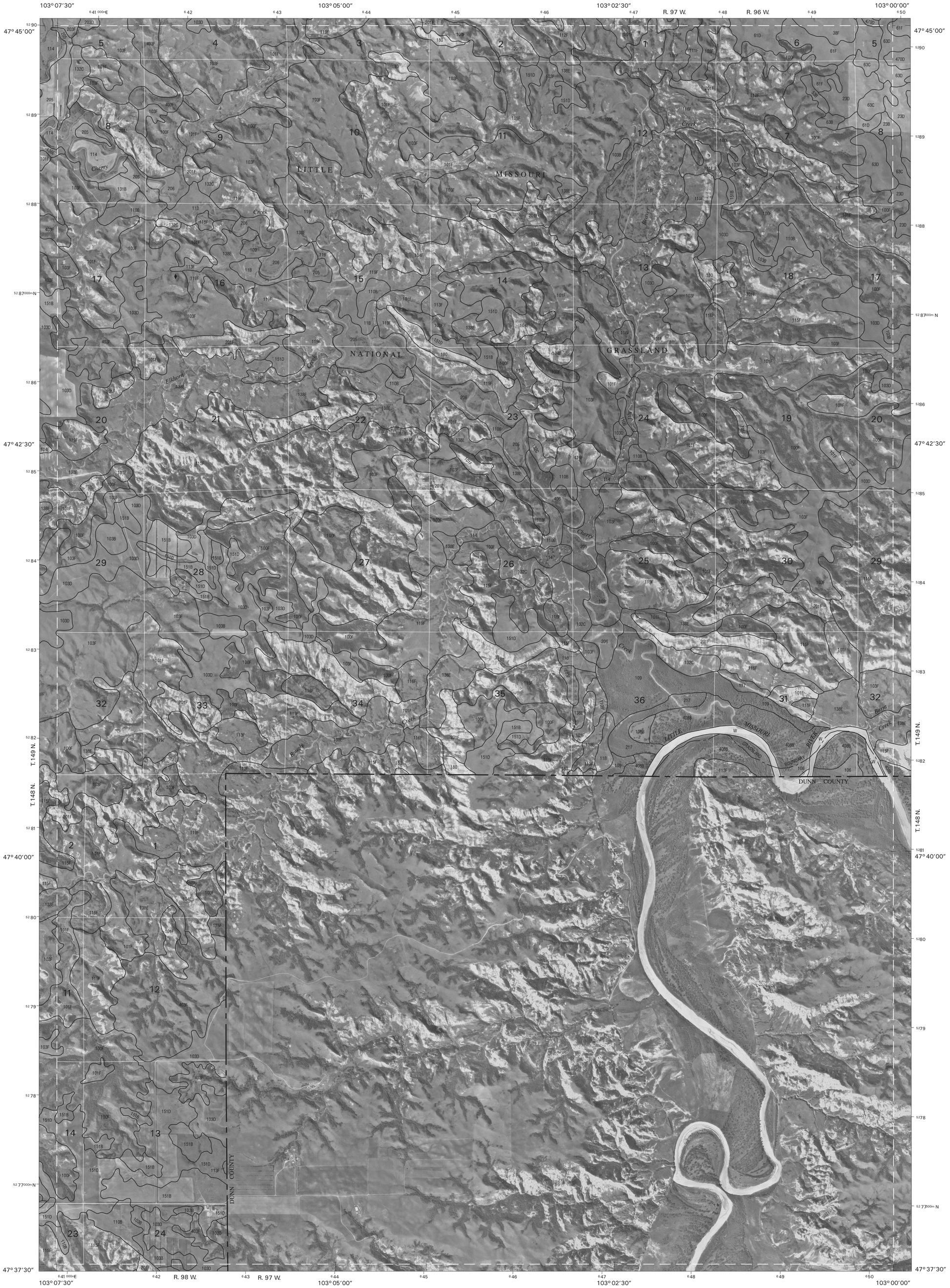
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LONE BUTTE NW, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 49 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
LONE BUTTE NE QUADRANGLE
SHEET NUMBER 50 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

37	38	39	37 SCHAFER 38 SCHAFER SE 39 JOHNSONS CORNER 49 LONE BUTTE NW 51 CROFF 61 LONE BUTTE 62 LONE BUTTE SE
49		51	
61	62		

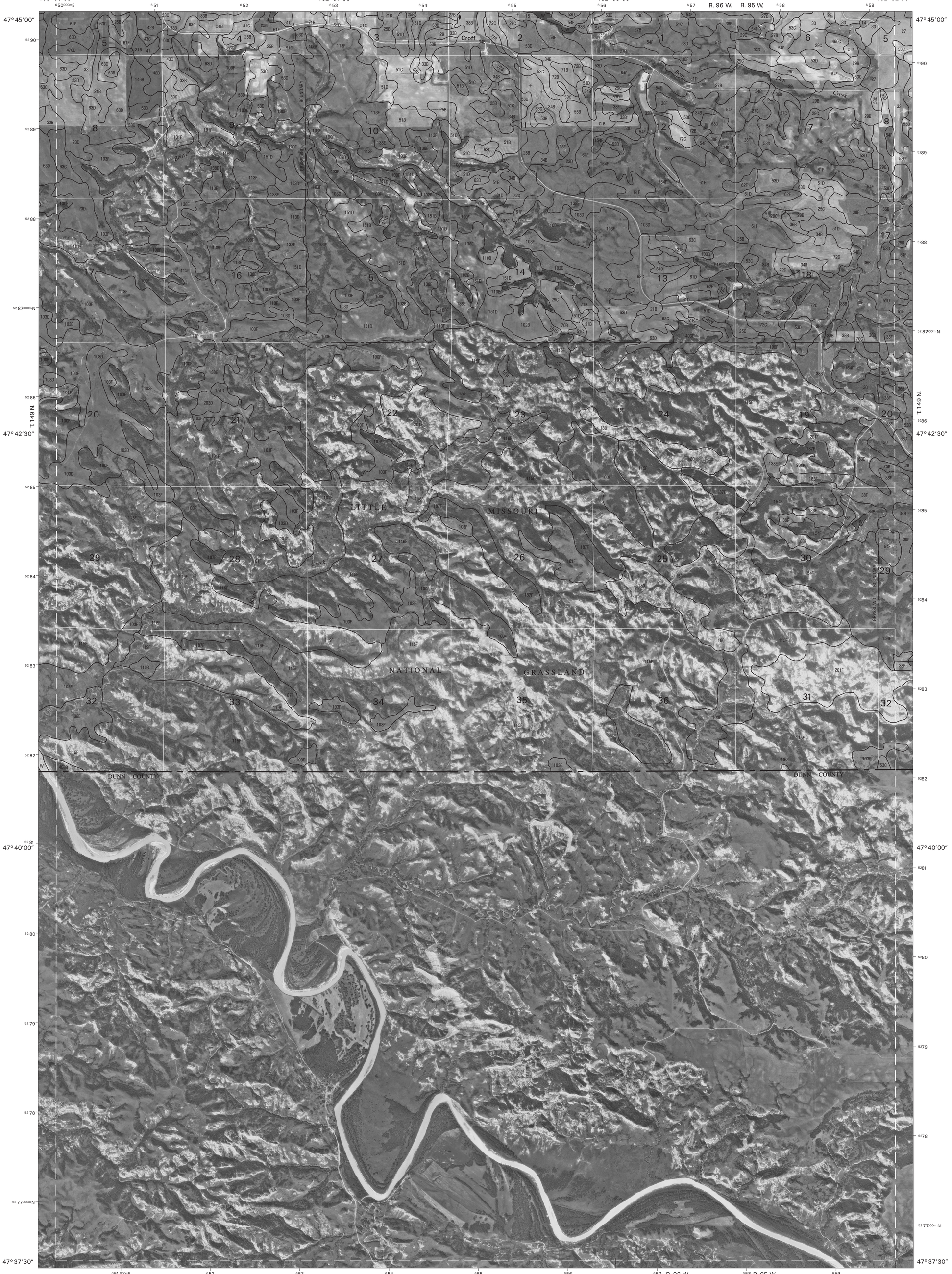
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LONE BUTTE NE, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 50 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
CROFF QUADRANGLE
SHEET NUMBER 51 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

38	39	40
50		52
62		

38 SCHAFER SE
39 JOHNSONS CORNER
40 BLUE BUTTES SE
50 LONE BUTTE NE
52 FIGURE 4 RANCH
62 LONE BUTTE SE

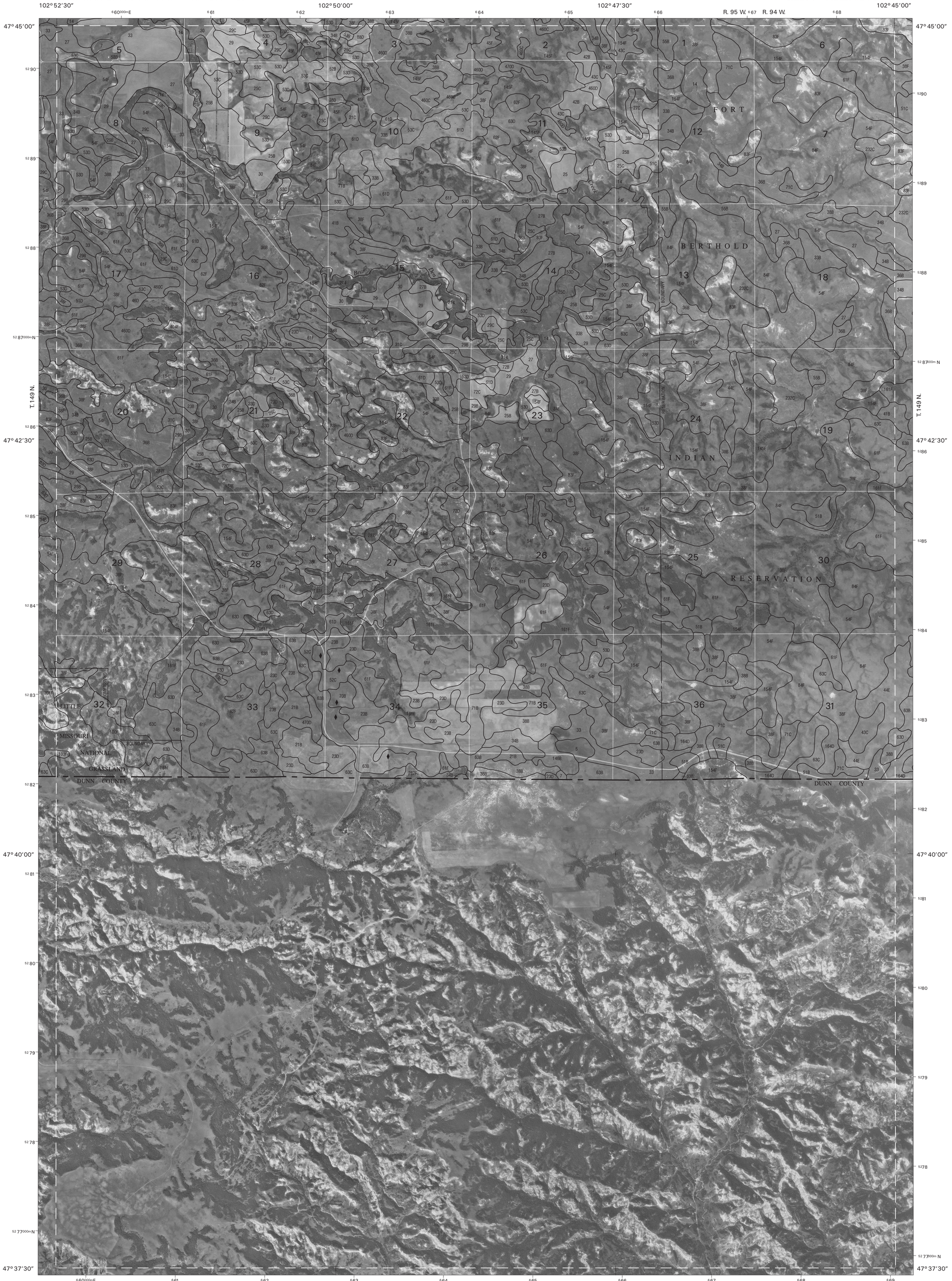
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CROFF, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 51 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

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MCKENZIE COUNTY, NORTH DAKOTA
FIGURE 4 RANCH QUADRANGLE
SHEET NUMBER 52 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

39	40	41	39 JOHNSONS CORNER 40 BLUE BUTTES SE 41 SANISH SW 51 CROFF 53 MANDAREE
51		53	

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FIGURE 4 RANCH, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 52 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
MANDAREE QUADRANGLE
SHEET NUMBER 53 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

40	41	40 BLUE BUTTES SE 41 SANISH SW
52		52 FIGURE 4 RANCH

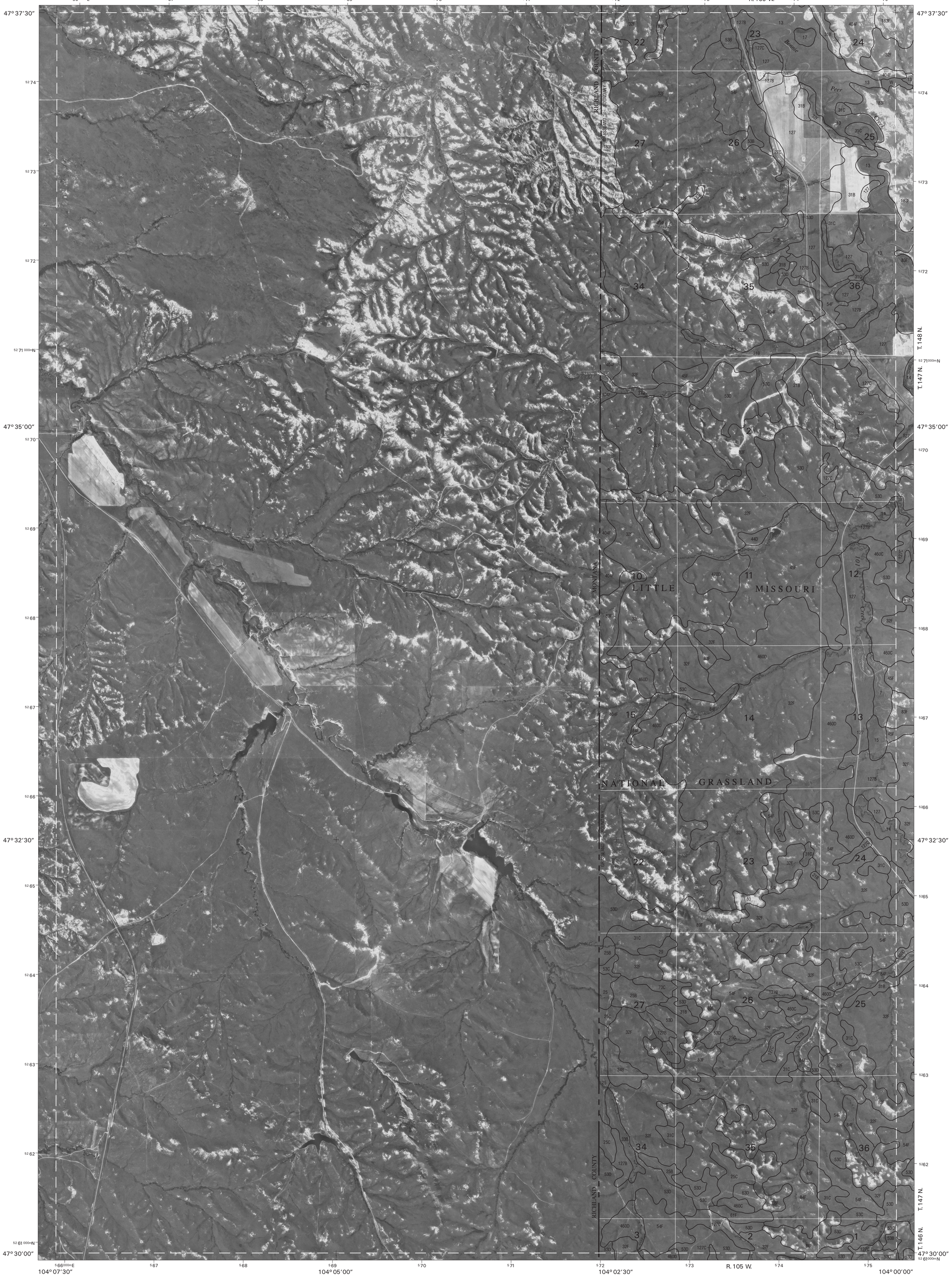
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MANDAREE, NORTH DAKOTA
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SHEET NUMBER 53 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
SIDNEY SE QUADRANGLE
SHEET NUMBER 54 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

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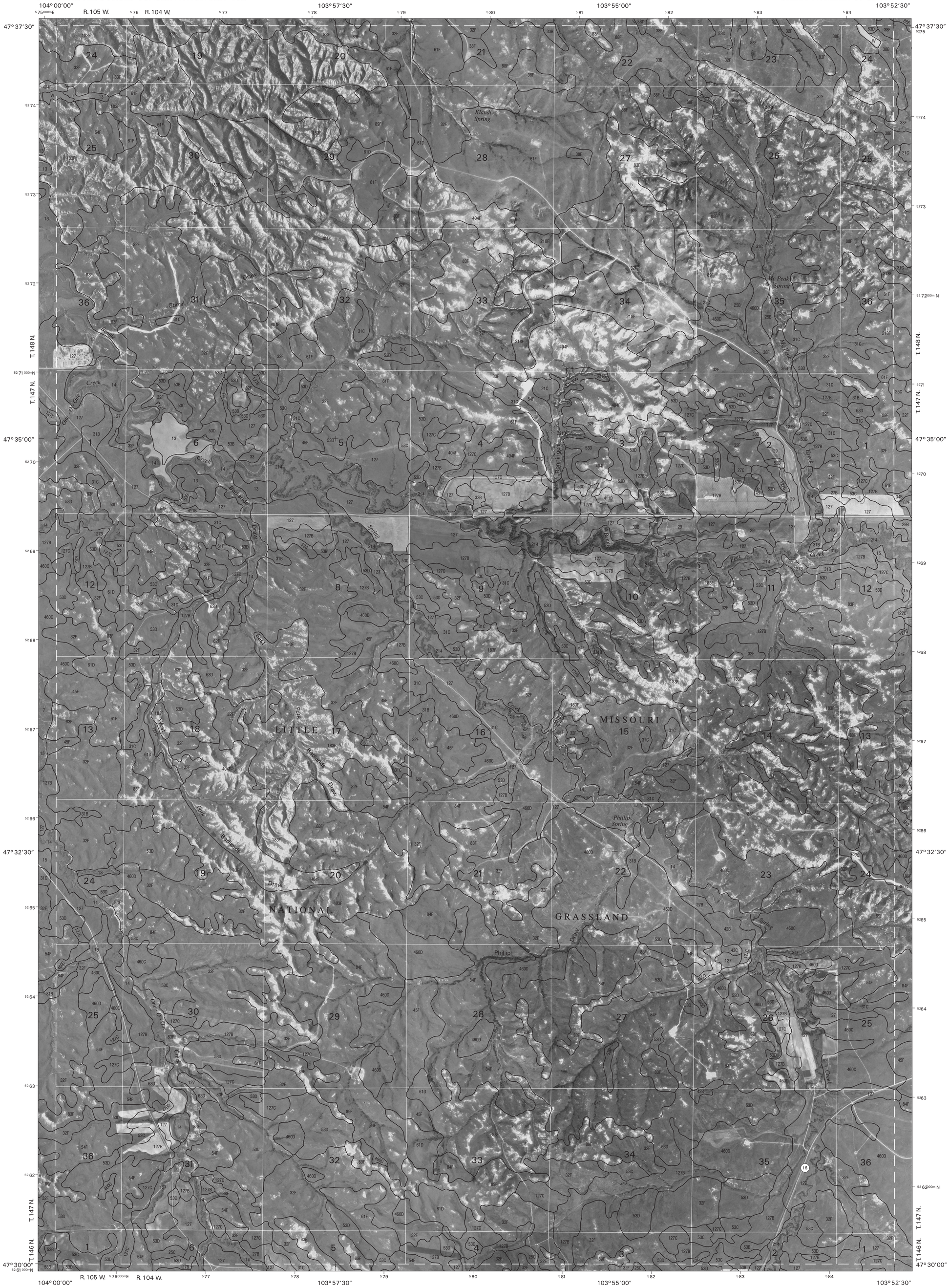
42 SIDNEY NE
43 HORSE CREEK SCHOOL
55 PHILLIP SPRING
63 SKAAR NE
64 SQUAW GAP

SIDNEY SE, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 54 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
PHILLIP SPRING QUADRANGLE
SHEET NUMBER 55 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

42	43	44
54		56
63	64	65

42 SIDNEY NE
43 HORSE CREEK SCHOOL
44 SATHER LAKE
54 SIDNEY SE
56 SHEEP CREEK
63 SKAAR NE
64 SQUAW GAP
65 FLAT ROCK BUTTE

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PHILLIP SPRING, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 55 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
SHEEP CREEK QUADRANGLE
SHEET NUMBER 56 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

43	44	45
55		57
64	65	66

43 HORSE CREEK SCHOOL
44 SATHER LAKE
45 MOLINE SCHOOL
55 PHILLIP SPRING
57 BURNING MINE BUTTE
64 SQUAW GAP
65 FLAT ROCK BUTTE
66 CINNAMON CREEK

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SHEEP CREEK, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 56 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
BURNING MINE BUTTE QUADRANGLE
SHEET NUMBER 57 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

44	45	46
56		58
65	66	67

INDEX TO ADJOINING 7.5 MAPS

44 SATHER LAKE
45 MOLINE SCHOOL
46 BEAR BUTTE
56 SHEEP CREEK
58 RED WING CREEK
65 FLAT ROCK BUTTE
66 CINNAMON CREEK
67 ICE BOX CANYON

BURNING MINE BUTTE, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 57 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
RED WING CREEK QUADRANGLE
SHEET NUMBER 58 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

45	46	47
57		59
66	67	68

45 MOLINE SCHOOL
46 BEAR BUTTE
47 STOCKE BUTTE
57 BURNING MINE BUTTE
59 SPERATI POINT
66 CINNAMON CREEK
67 ICE BOX CANYON
68 WOLF COULEE

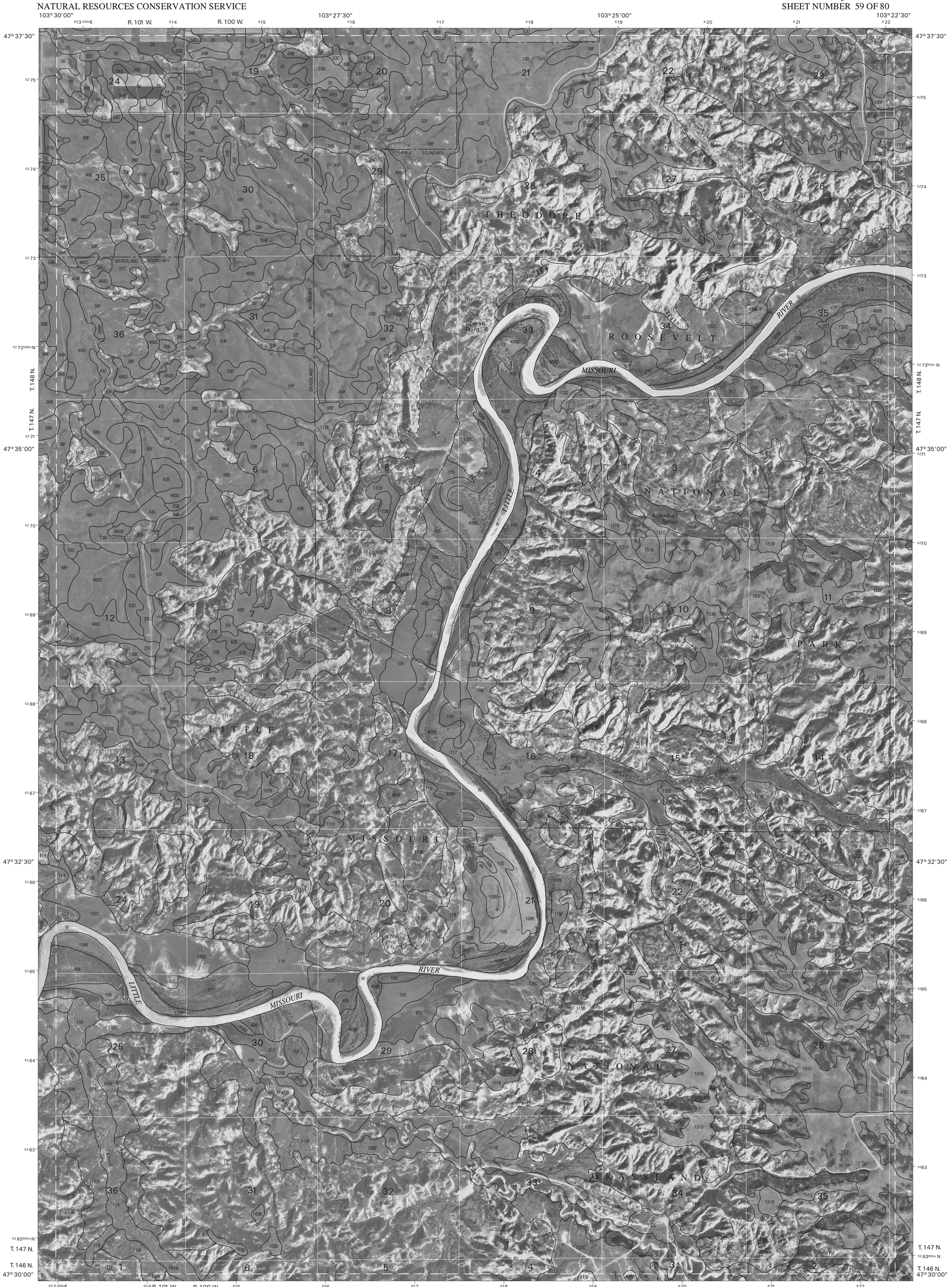
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RED WING CREEK, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 58 OF 80

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DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
SPERATI POINT QUADRANGLE
SHEET NUMBER 59 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

46	47	48
58		60
67	68	69

46 BEAR BUTTE
47 STOCKE BUTTE
48 TEPEE BUTTES
58 RED WING CREEK
60 LONG X DIVIDE
67 ICE BOX CANYON
68 WOLF COULEE
69 BUCKSKIN BUTTE

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SPERATI POINT, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 59 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
LONG X DIVIDE QUADRANGLE
SHEET NUMBER 60 OF 80

103°22′30″ 103°20′00″ 103°17′30″ 103°15′00″
47°37′30″ 47°35′00″ 47°32′30″

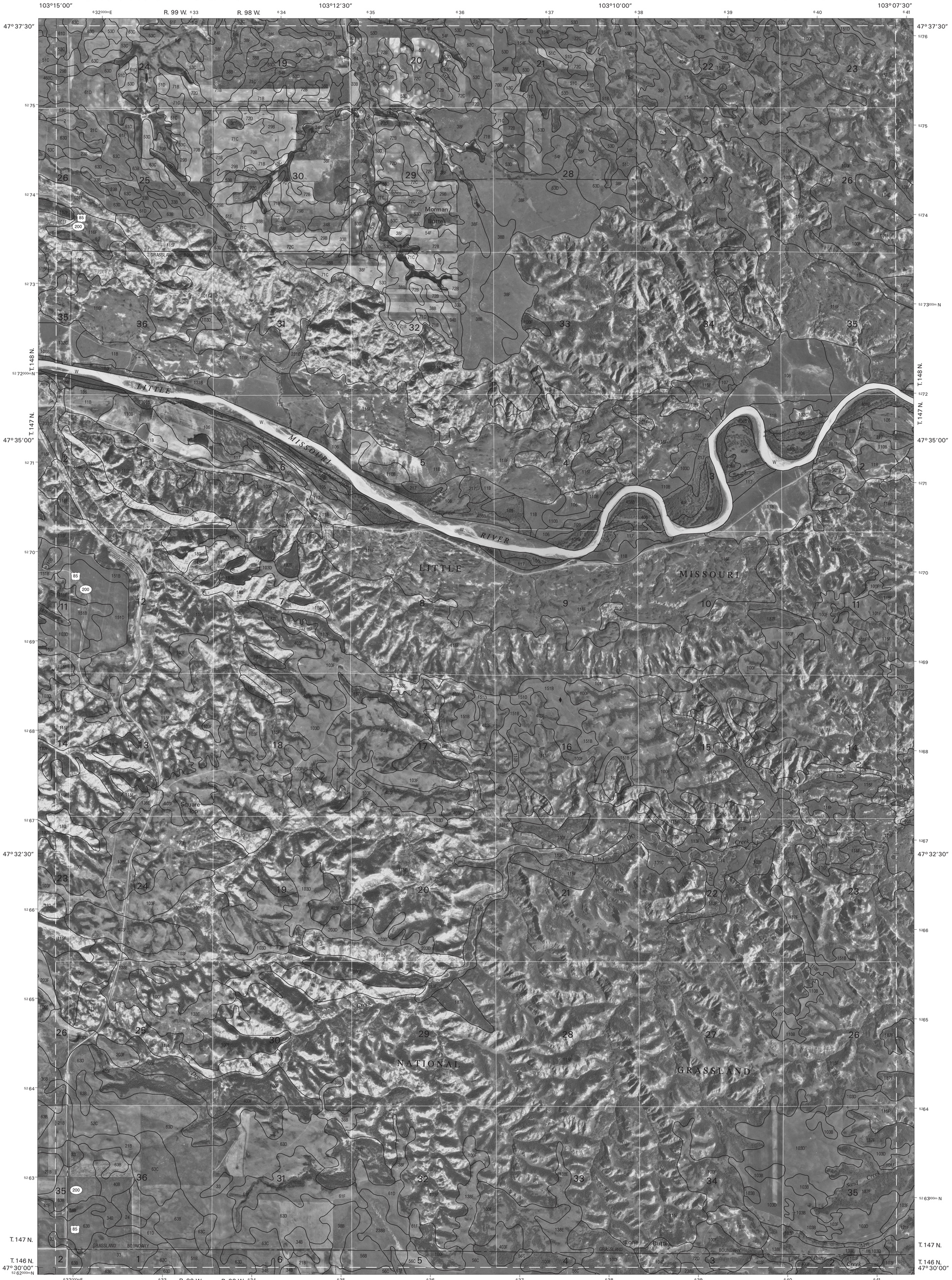
R. 100 W. R. 99 W.

T. 148 N.
T. 147 N.
T. 146 N.

LITTLE MISSOURI NATIONAL GRASSLAND
THEODORE ROOSEVELT NATIONAL PARK
LONG X DIVIDE
Cedar Canyon
Squaw Creek Campground
BOUNDARY
GRASSLAND BOUNDARY
MISSOURI RIVER
Corral Creek
Sullivan Creek
Buffalo Gap
Grassland Road
Grassland Road
Grassland Road

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
LONE BUTTE QUADRANGLE
SHEET NUMBER 61 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

48	49	50
60		62
69	70	71

48 TEPEE BUTTES
49 LONE BUTTE NW
50 LONE BUTTE NE
60 LONG X DIVIDE
62 LONE BUTTE SE
69 BUCKSKIN BUTTE
70 GRASSY BUTTE
71 PETES CREEK

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LONE BUTTE, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 61 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
LONE BUTTE SE QUADRANGLE
SHEET NUMBER 62 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

49	50	51	49 LONE BUTTE NW 50 LONE BUTTE NE 51 CROFF
61			61 LONE BUTTE
70	71		70 GRASSY BUTTE 71 PETES CREEK

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LONE BUTTE SE, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 62 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
SKAAR NE QUADRANGLE
SHEET NUMBER 63 OF 80

104° 07′ 30″ — 104° 05′ 00″ — 104° 02′ 30″ — 104° 00′ 00″
47° 30′ 00″ — 47° 27′ 30″ — 47° 25′ 00″ — 47° 22′ 30″
R. 105 W.

RICHLAND COUNTY
GRASSLAND
LITTLE MISSOURI NATIONAL GRASSLAND
MONTANA
WIBAUX COUNTY
T. 146 N.
T. 145 N.
Little Missouri River
Poison Spring Creek

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES: 1 0 1

FEET: 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS: 1 0 1

	54	55	54 SIDNEY SE 55 PHILLIP SPRING
		64	64 SQUAW GAP
	72	73	72 SKAAR 73 TROTTERS

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SKAAR NE, NORTH DAKOTA
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SHEET NUMBER 63 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

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DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
SQUAW GAP QUADRANGLE
SHEET NUMBER 64 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

54	55	56
63		65
72	73	74

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54 SIDNEY SE
55 PHILLIP SPRING
56 SHEEP CREEK
63 SKAAR NE
65 FLAT ROCK BUTTE
72 SKAAR
73 TROTTERS
74 TROTTERS SE

SQUAW GAP, NORTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 64 OF 80

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
FLAT ROCK BUTTE QUADRANGLE
SHEET NUMBER 65 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

55	56	57
64		66
73	74	75

55 PHILLIP SPRING
56 SHEEP CREEK
57 BURNING MINE BUTTE
64 SQUAW GAP
66 CINNAMON CREEK
73 TROTTERS
74 TROTTERS SE
75 EAGLE DRAW

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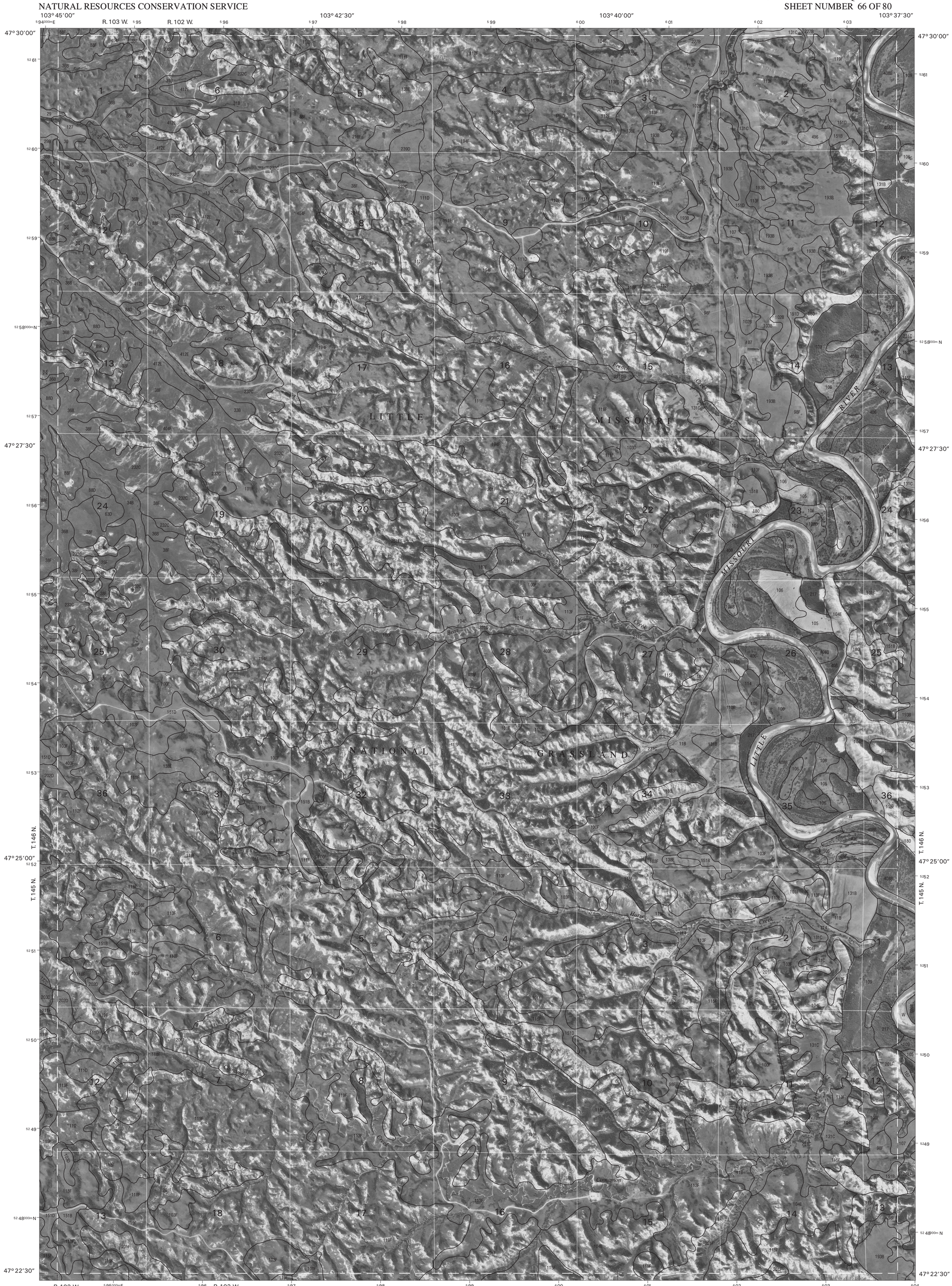
FLAT ROCK BUTTE, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 65 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
CINNAMON CREEK QUADRANGLE
SHEET NUMBER 66 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

INDEX TO ADJOINING 7.5 MAPS

56	57	58
65		67
74	75	76

56 SHEEP CREEK
57 BURNING MINE BUTTE
58 RED WING CREEK
65 FLAT ROCK BUTTE
67 ICE BOX CANYON
74 TROTTERS SE
75 EAGLE DRAW
76 HANKS GULLY

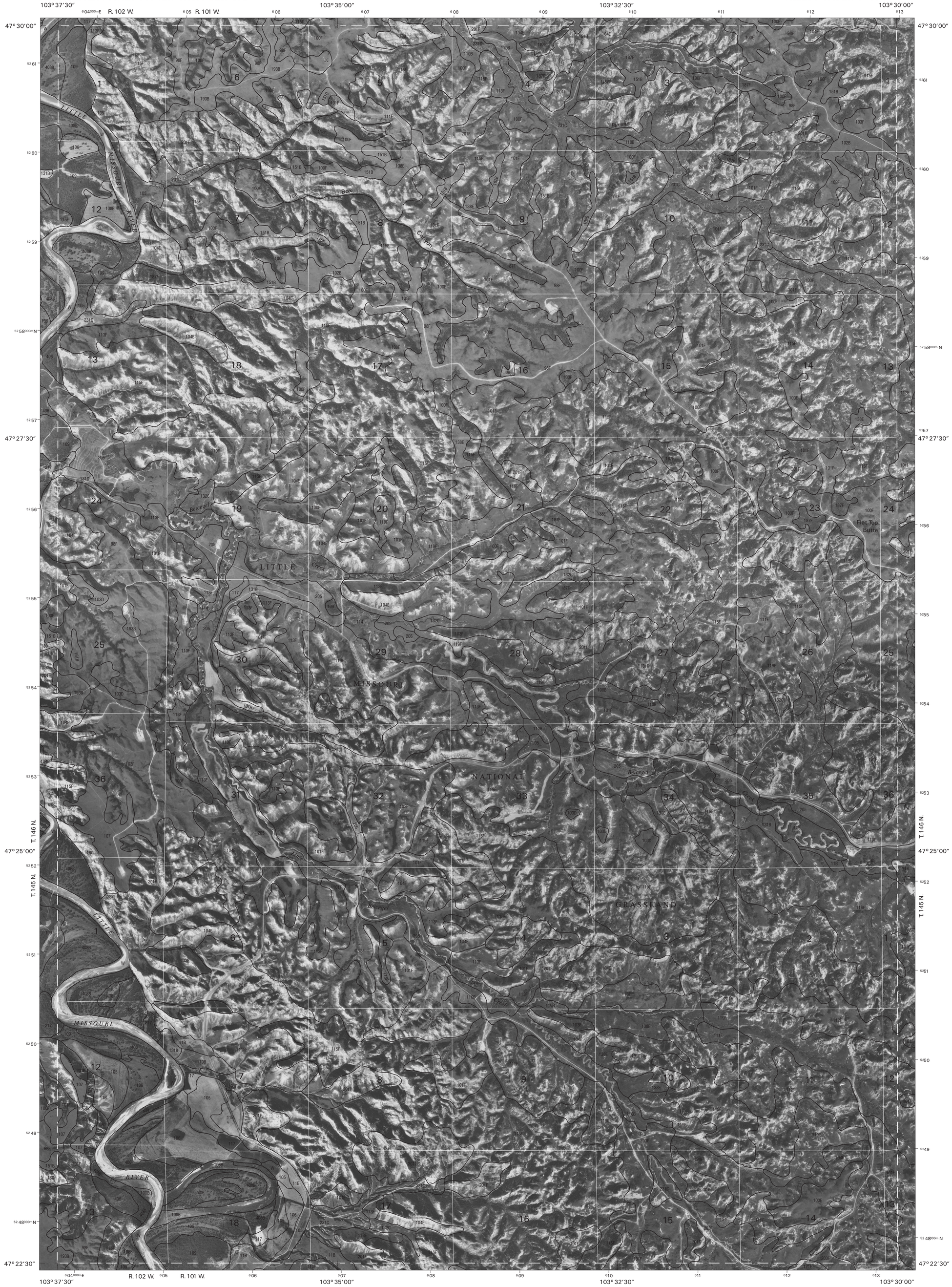
CINNAMON CREEK, NORTH DAKOTA

7.5 MINUTE SERIES
SHEET NUMBER 66 OF 80

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
ICE BOX CANYON QUADRANGLE
SHEET NUMBER 67 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

57	58	59
66		68
75	76	77

57 BURNING MINE BUTTE
58 RED WING CREEK
59 SPERATI POINT
66 CINNAMON CREEK
68 WOLF COULEE
75 EAGLE DRAW
76 HANKS GULLY
77 SQUARETOP BUTTE

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ICE BOX CANYON, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
WOLF COULEE QUADRANGLE
SHEET NUMBER 68 OF 80

103°30′00″ 613 000mE R. 101 W. 614 R. 100 W. 615 103°27′30″ 616 617 618 103°25′00″ 619 620 621 622 103°22′30″

47°30′00″ 52 61 52 60 52 59 52 58 000mN 52 57 47°27′30″ 52 56 52 55 52 54 52 53 47°25′00″ 52 52 52 51 52 50 52 49 52 48 000mN 47°22′30″

LITTLE MISSOURI NATIONAL GRASSLAND

Sheep Creek · Buckboard Creek · Bennett Creek · Cottonwood Creek · Creek · Burning Hills · Wolf Coulee · Beaver Creek

T. 146 N. T. 145 N.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

58	59	60
67		69
76	77	78

58 RED WING CREEK
59 SPERATI POINT
60 LONG X DIVIDE
67 ICE BOX CANYON
69 BUCKSKIN BUTTE
76 HANKS GULLY
77 SQUARETOP BUTTE
78 SCAIRT WOMAN DRAW

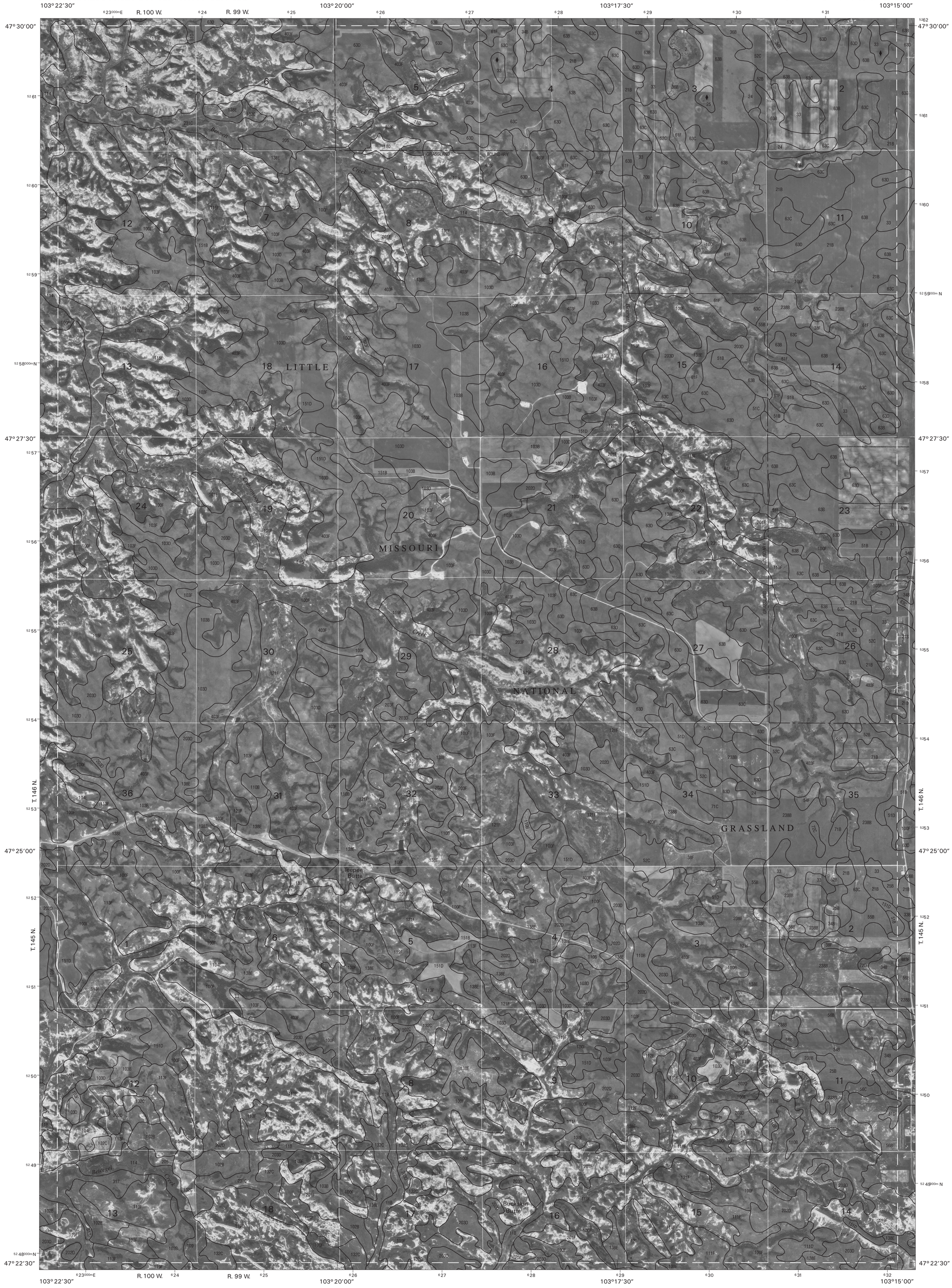
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WOLF COULEE, NORTH DAKOTA
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

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MCKENZIE COUNTY, NORTH DAKOTA
BUCKSKIN BUTTE QUADRANGLE
SHEET NUMBER 69 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

59	60	61
68		70
77	78	79

59 SPERATI POINT
60 LONG X DIVIDE
61 LONE BUTTE
68 WOLF COULEE
70 GRASSY BUTTE
77 SQUARETOP BUTTE
78 SCAIRT WOMAN DRAW
79 GRASSY BUTTE SW

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BUCKSKIN BUTTE, NORTH DAKOTA

7.5 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
GRASSY BUTTE QUADRANGLE
SHEET NUMBER 70 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

60	61	62
69		71
78	79	80

60 LONG X DIVIDE
61 LONE BUTTE
62 LONE BUTTE SE
69 BUCKSKIN BUTTE
71 PETES CREEK
78 SCAIRT WOMAN DRAW
79 GRASSY BUTTE SW
80 GRASSY BUTTE SE

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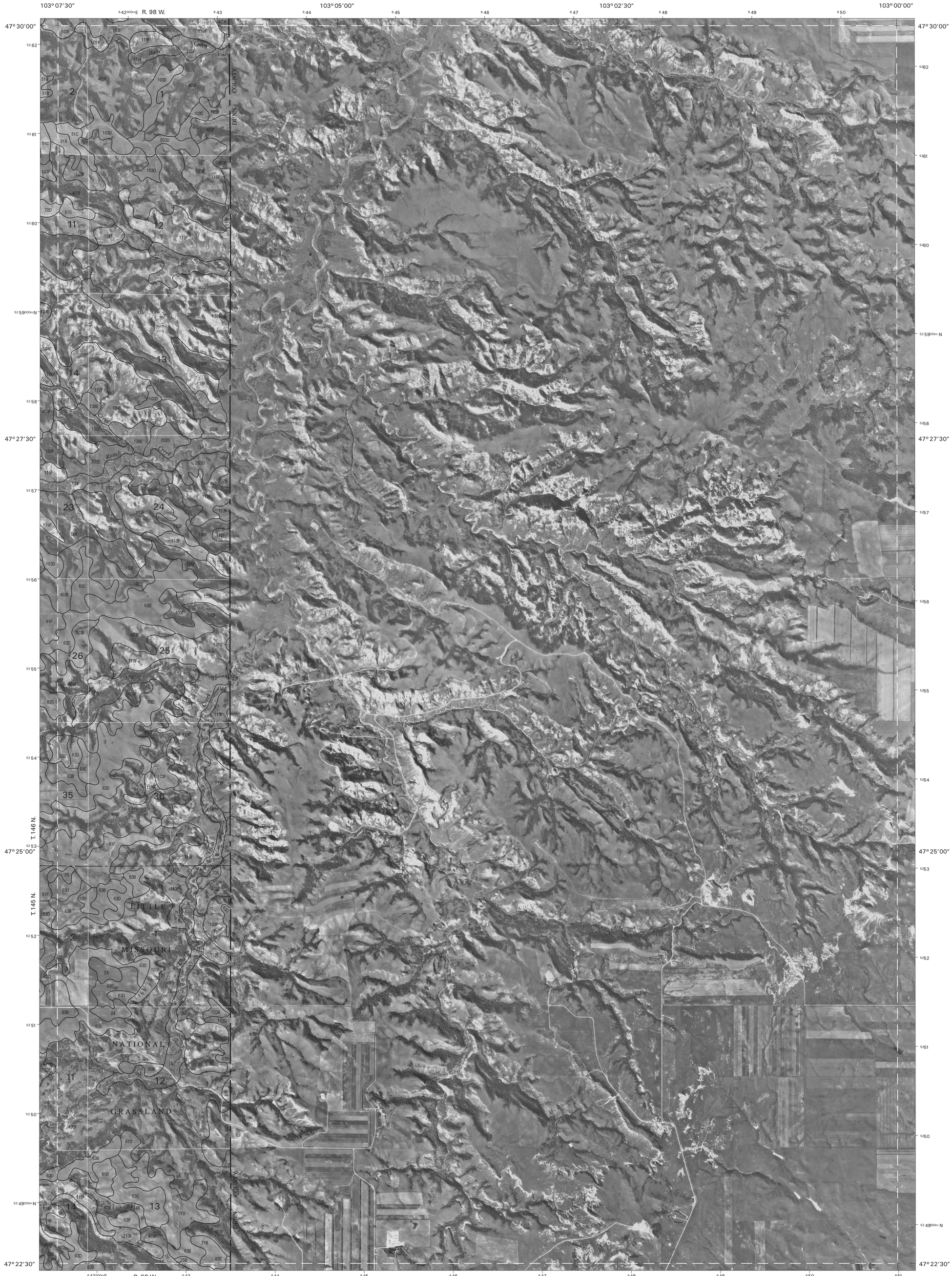
GRASSY BUTTE, NORTH DAKOTA

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
PETES CREEK QUADRANGLE
SHEET NUMBER 71 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

61	62		61 LONE BUTTE 62 LONE BUTTE SE
70			70 GRASSY BUTTE
79	80		79 GRASSY BUTTE SW 80 GRASSY BUTTE SE

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PETES CREEK, NORTH DAKOTA

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
SKAAR QUADRANGLE
SHEET NUMBER 72 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

	63	64
		73

63 SKAAR NE
64 SQUAW GAP
73 TROTTERS

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SKAAR, NORTH DAKOTA
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UNITED STATES
DEPARTMENT OF AGRICULTURE
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MCKENZIE COUNTY, NORTH DAKOTA
TROTTERS QUADRANGLE
SHEET NUMBER 73 OF 80



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

63	64	65	63 SKAAR NE 64 SQUAW GAP 65 FLAT ROCK BUTTE
72		74	72 SKAAR 74 TROTTERS SE

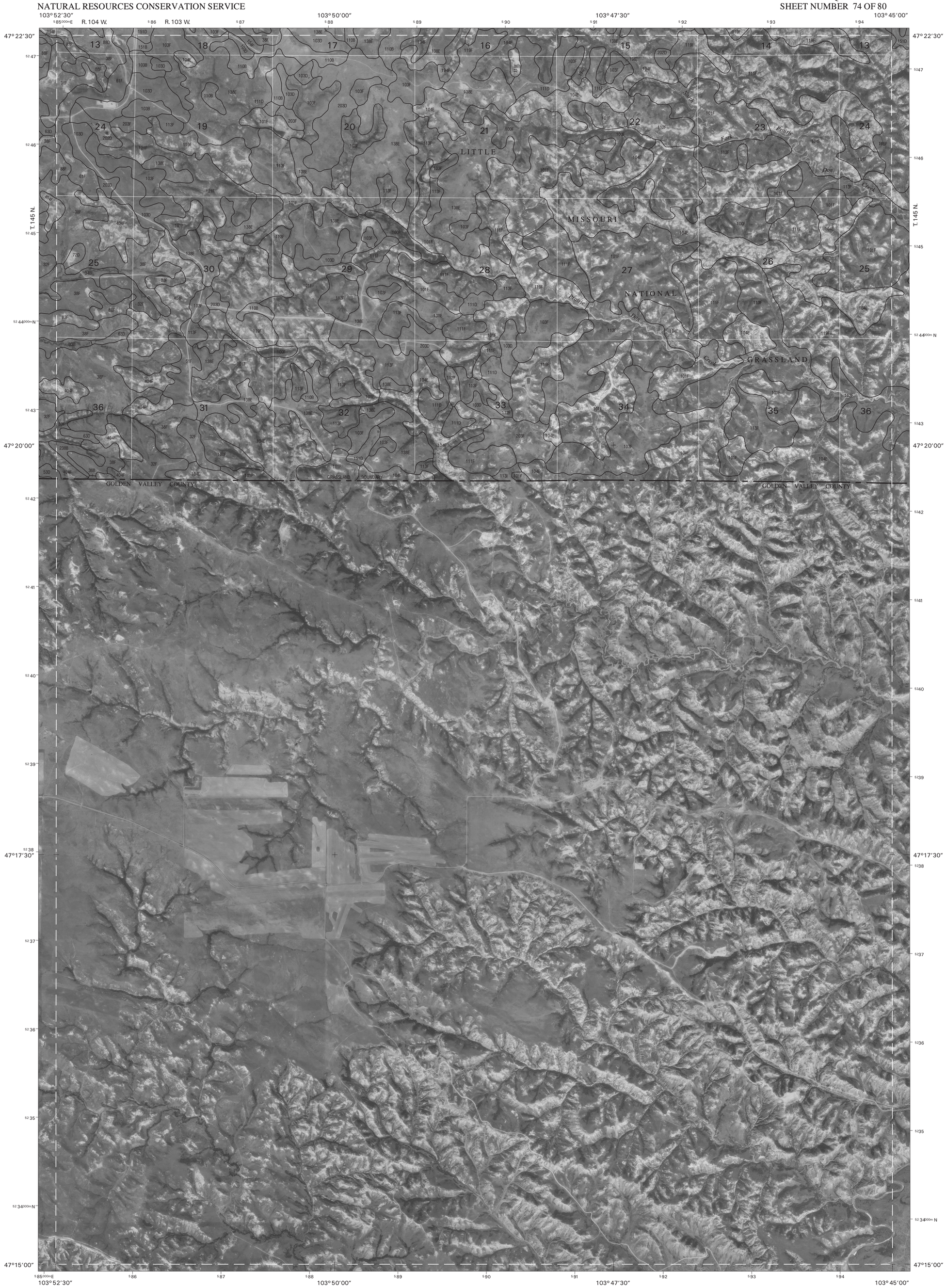
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

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MCKENZIE COUNTY, NORTH DAKOTA
TROTTERS SE QUADRANGLE
SHEET NUMBER 74 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

64	65	66
73		75

64 SQUAW GAP
65 FLAT ROCK BUTTE
66 CINNAMON CREEK
73 TROTTERS
75 EAGLE DRAW

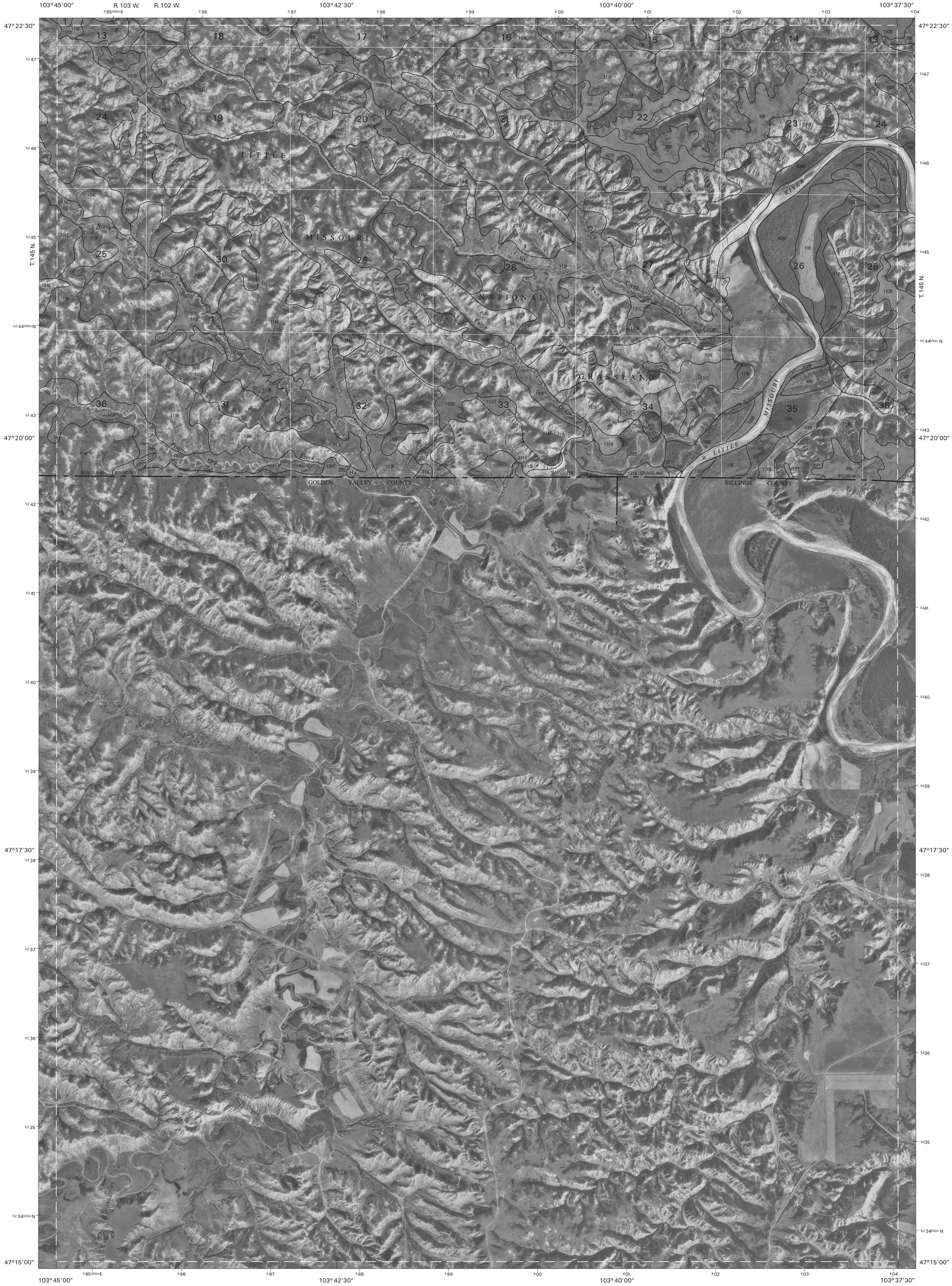
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TROTTERS SE, NORTH DAKOTA
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

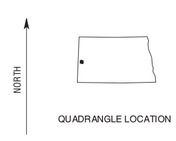
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MCKENZIE COUNTY, NORTH DAKOTA
EAGLE DRAW QUADRANGLE
SHEET NUMBER 75 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

65	66	67
74		76

65 FLAT ROCK BUTTE
66 CINNAMON CREEK
67 ICE BOX CANYON
74 TROTTERS SE
76 HANKS GULLY

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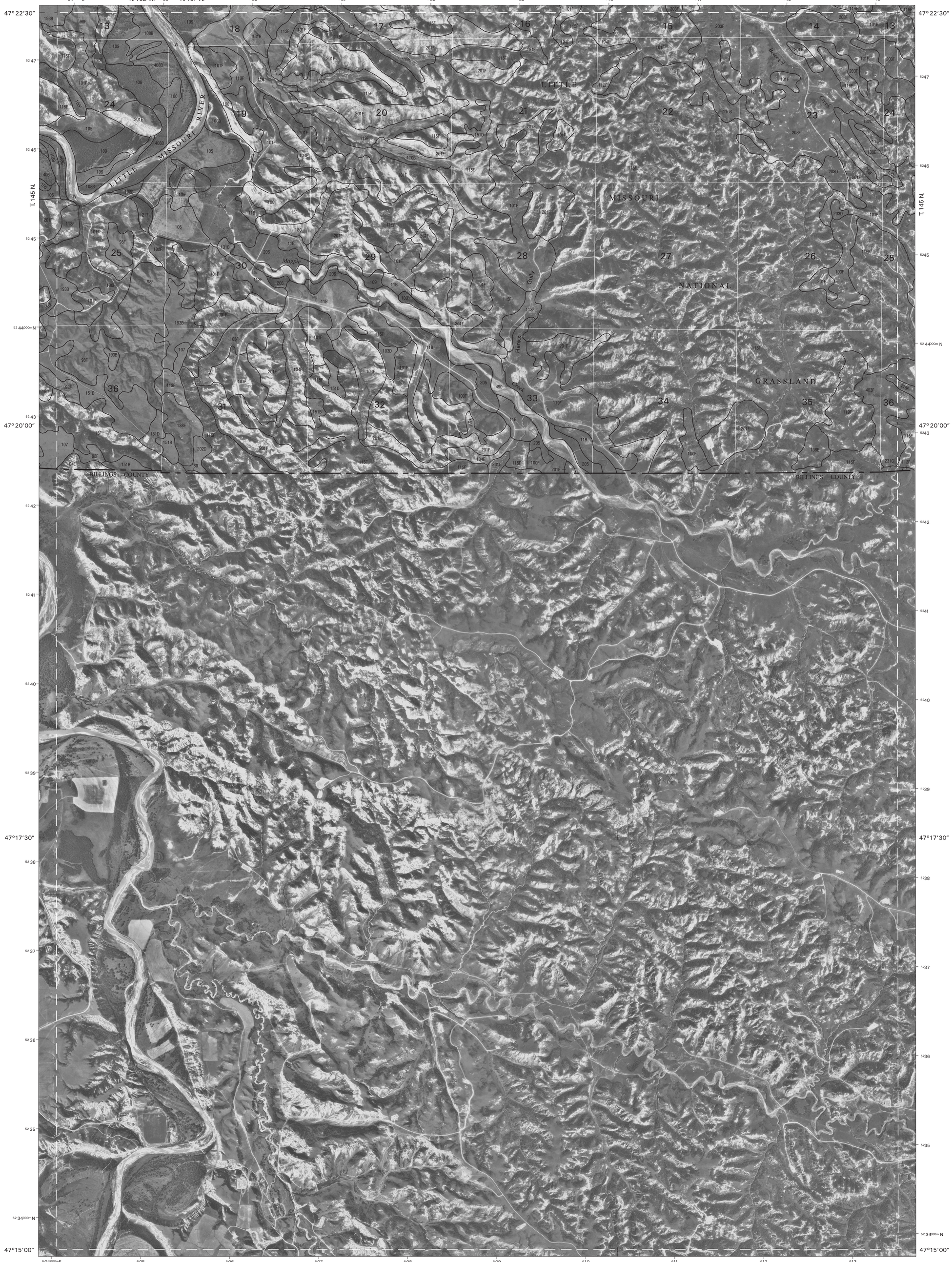
EAGLE DRAW, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
HANKS GULLY QUADRANGLE
SHEET NUMBER 76 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

66	67	68
75		77

66 CINNAMON CREEK
67 ICE BOX CANYON
68 WOLF COULEE
75 EAGLE DRAW
77 SQUARETOP BUTTE

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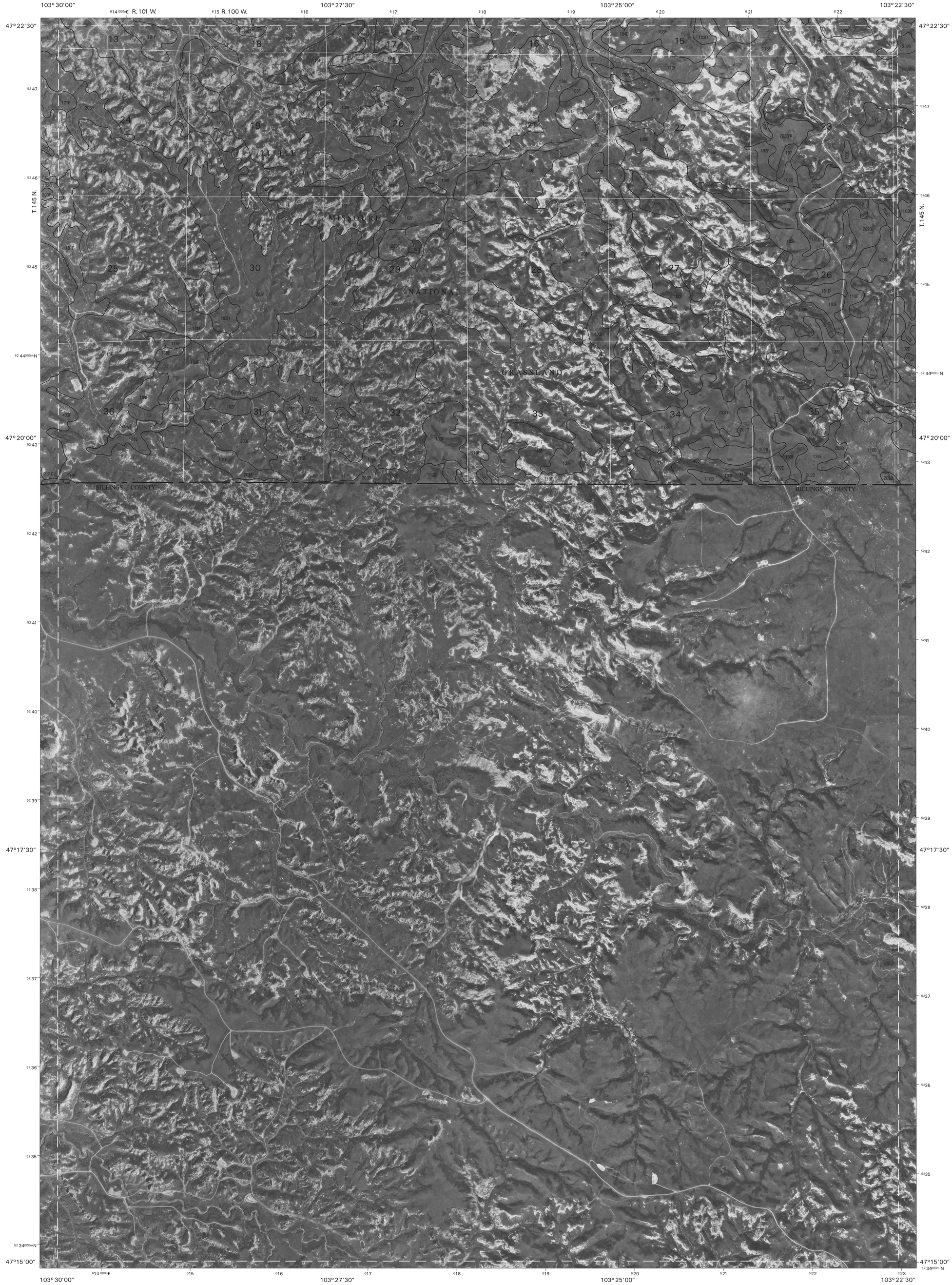
HANKS GULLY, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
SQUARETOP BUTTE QUADRANGLE
SHEET NUMBER 77 OF 80



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NORTH



QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

67	68	69	67 ICE BOX CANYON 68 WOLF COULEE 69 BUCKSKIN BUTTE
76		78	76 HANKS GULLY 78 SCAIRT WOMAN DRAW

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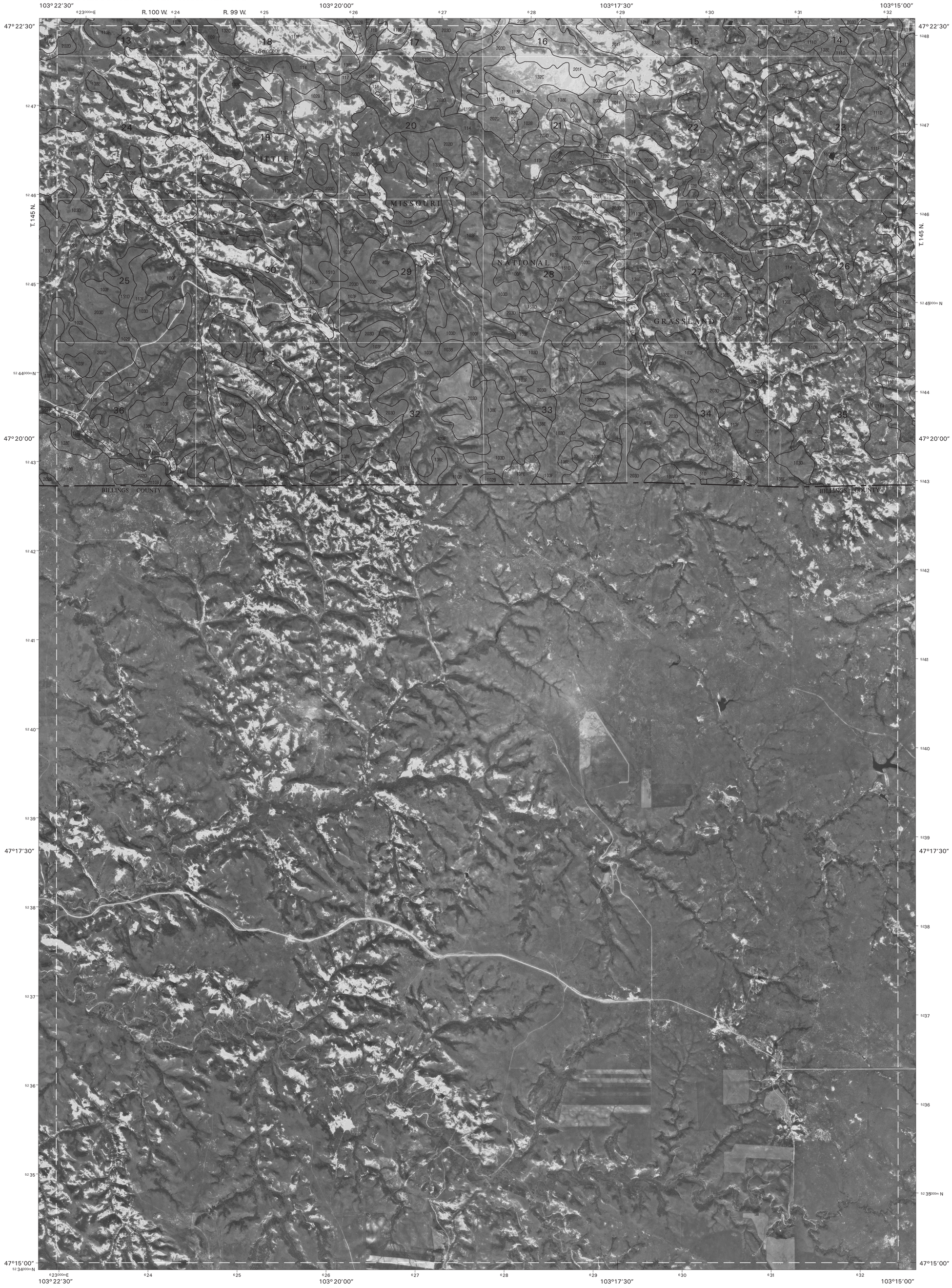
SQUARETOP BUTTE, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
SCAIRT WOMAN DRAW QUADRANGLE
SHEET NUMBER 78 OF 80



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North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

68	69	70
77		79

68 WOLF COULEE
69 BUCKSKIN BUTTE
70 GRASSY BUTTE
77 SQUARETOP BUTTE
79 GRASSY BUTTE SW

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SCAIRT WOMAN DRAW, NORTH DAKOTA

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MCKENZIE COUNTY, NORTH DAKOTA
GRASSY BUTTE SW QUADRANGLE
SHEET NUMBER 79 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

69	70	71
78		80

69 BUCKSKIN BUTTE
70 GRASSY BUTTE
71 PETES CREEK
78 SCAIRT WOMAN DRAW
80 GRASSY BUTTE SE

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GRASSY BUTTE SW, NORTH DAKOTA

7.5 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

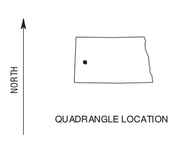
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MCKENZIE COUNTY, NORTH DAKOTA
GRASSY BUTTE SE QUADRANGLE
SHEET NUMBER 80 OF 80



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey (USGS), from 1991-1997 aerial photography. Cultural information and the public land survey system (PLSS) were derived from the USGS. Boundaries and PLSS were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

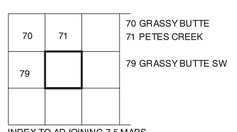


SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS



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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.